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OCT 11 1943

The OIL AND GAS JOURNAL

Photo by U. S. ARMY SIGNAL CORPS

Centrifugal Castings Speed Artillery Production!

Centrifugally cast gun barrels have helped to produce enough big ...ns during the past 18 months to relieve a tremendous shortage in ...llied heavy-artillery.

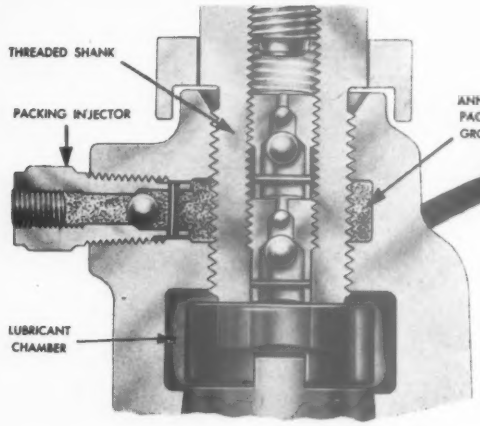
Developments by the U. S. Army Ordnance Department at their ...atertown, Mass. arsenal, made possible this remarkable achievement. ...ith their Watertown arsenal as a pilot plant, the Dickson Gun Plant ...as built to produce barrels for 40, 90 and 105-millimeter guns.

Called upon to operate the Dickson Gun Plant, Hughes Tool Company also acted in a consulting capacity in the design and construction of this new "arsenal." Ground was broken on the bald prairie in March, 1941, and within less than a year the first units were in production.

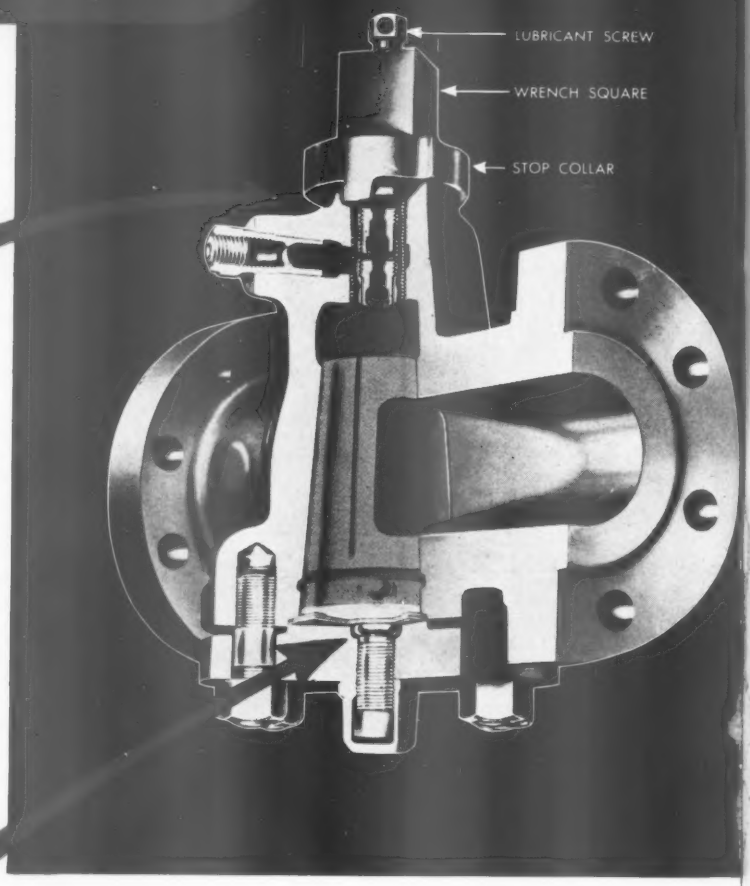
Hughes Tool Company, deeply aware of the responsibility as well as the honor of operating this Ordnance Arsenal, used personnel from the Hughes Main Plant for key positions at Dickson—at the same time maintaining the Main Plant's production for Victory . . . production which includes tools for the essential Oil Well Drilling Industry.

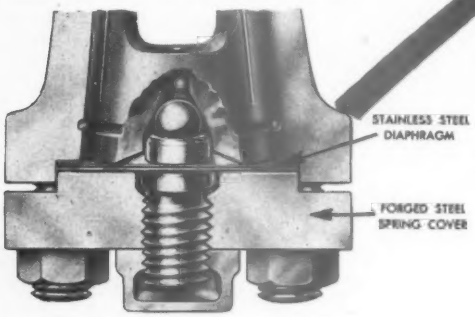
PRICE 20 CENTS OCTOBER 7, 1943

ENGINEERED FOR LEAK RESISTANCE AT ANY PRESSURE



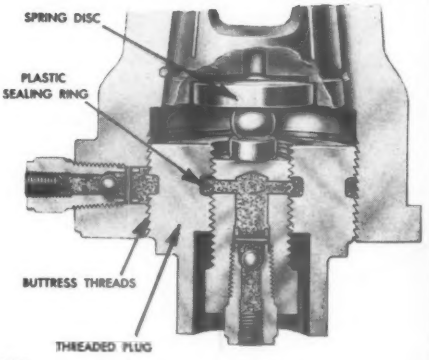
The Hypreseal Valve plug is rotated by means of a non-integral stem, threaded into the body to carry the thrust of the internal fluid pressure. The threaded operating shank is surrounded by an annular seal filled with a special plastic fibrous packing. The Hypreseal can be repacked while under full line pressure. Lubricant applied hydraulically, by turning down the top lubricant screw, is transmitted through channels, forming a positive seal around the ports to prevent leakage internally or externally.





This view shows the construction of the Hypreseal with forged steel spring bottom plate. Steel diaphragm forms an impervious seal through which no leakage can occur. A sealed screw provides precise adjustment.

NORDSTROM HYPRESEAL VALVES



This view shows the construction of the Hypreseal with screwed bottom plug which is threaded into the valve body, provided with an extra seal of special plastic packing, for working pressures up to 7500 lbs., and for any temperature.

"KEEP UPKEEP DOWN"

MERCO NORDSTROM VALVE CO.

A Subsidiary of Pittsburgh Equitable Meter Co.

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Branches: Boston, Brooklyn, Buffalo, Chicago, Columbia, Houston, Kansas City, Los Angeles, Memphis, New York, Oakland, San Francisco, Seattle, Tulsa

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the OIL AND GAS JOURNAL

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BAKER OIL TOOLS, INC.

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19 Rector Street, New York, N. Y.

General Heading: BAKER MODEL "K" CEMENT RETAINER

Unit No. A-26

Subject: Cementing-Off Gas Sand

Index: 250.1
Date: October 7, 1943
Page: 1 of 1 pg.

For many years the Baker Model "K" Cement Retainer has been "standard equipment" for solving many of the ordinary, as well as complex, materials and precious time, it is more essential repair and well completion operations.

Today, with the necessity of conserving vital materials and precious time, it is more essential than ever before that every precaution be taken to insure the success of such repair and completion work as is necessary.

The Baker Cement Retainer has behind it a record of thousands of successful jobs, plus a service organization that has specialized in cementing problems. If you are not familiar with this device, it is suggested that you secure complete details from the nearest Baker office or field representative.

PROBLEM:

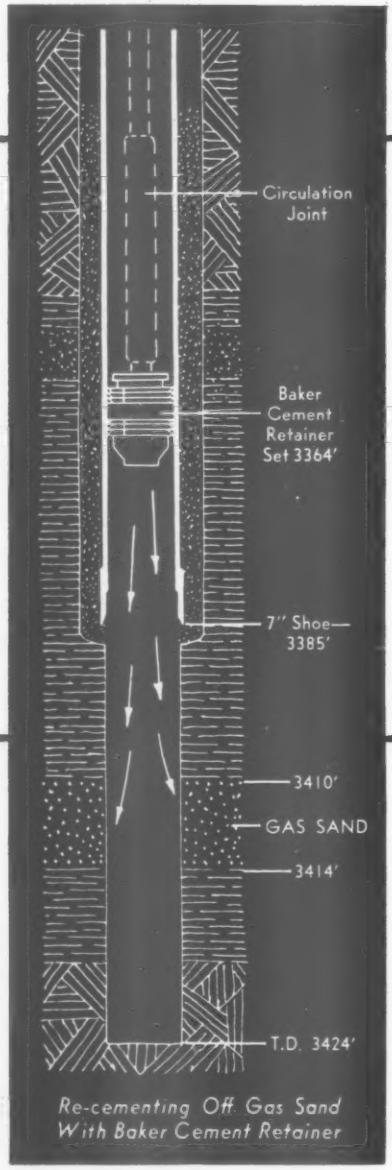
To Cement-Off a Gas Sand After Previous Attempts and Methods Proved Unsuccessful.

METHOD:

Set Cement Retainer and Squeeze Cement Below Casing Shoe with Multiple Batch Method.

RESULT:

Gas Sand Successfully Cemented-Off.



Re-cementing Off Gas Sand With Baker Cement Retainer

• DETAILS •

Field: Jal, N. M.
Depth of Well: 3424'
Depth Retainer Set: 3364'
Breakdown Pressure: 2000#
Final Pressure: 2600#
Number of Sax Mixed: 150
Number of Sax Put Away: 150
How Cement Discharged: Through Shoe into Open Hole below

★

Complete details concerning the Baker Model "K" Cement Retainer and its many practical field applications will also be found on pages 250 and 263 of the 1942 Baker, or composite, Catalog.

★

Competent Baker men will service, make suggestions, and otherwise assist in securing best possible results.

BAKER CEMENT RETAINER

the OIL AND GAS JOURNAL

Trends

Crude-Oil Production
By States — Page 98

CRUDE-OIL STOCKS 233,013,000 bbl. as of Sept. 25—down 2,2,000 bbl. One year ago 242,785,000.

GASOLINE STOCKS 70,024,000 bbl. as of Sept. 25—down 1,275,000 bbl. One year ago 78,474,000 bbl.

RESIDUAL FUEL-OIL STOCK 67,645,000 bbl. as of Sept. 25—up 752,000. One year ago 79,341,000.

GAS OIL AND DISTILLATES 40,328,000 bbl. as of Sept. 25—up 29,000 bbl. One year ago 45,967,000.

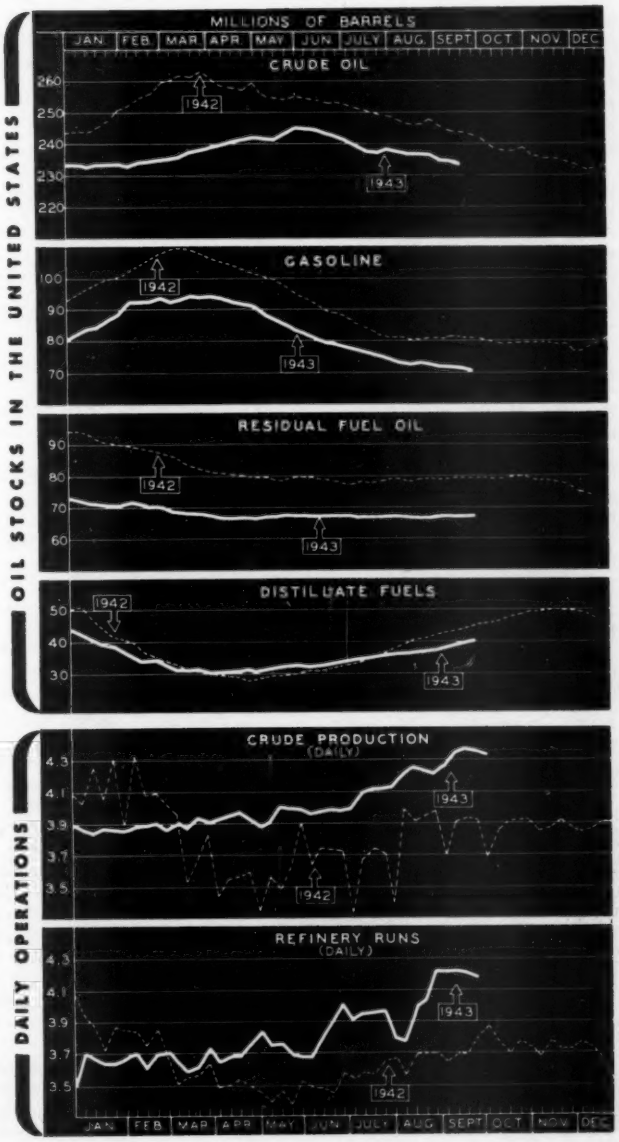
CRUDE PRODUCTION 4,324,955 bbl. daily average—down 30,840 bbl. One year ago 3,686,445.

REFINERY RUNS 4,156,000 bbl. daily week ended Sept. 25—down 53,000 bbl. One year ago 3,834,000.

THE action of OPA in reducing B and C gasoline coupons east of the Rocky Mountains to 2 gal. and announcement Monday that more severe rationing would be effective in Districts 4 and 5 are additional evidence that the civilian-gasoline situation is becoming more and more critical. In this connection it is known that committees representing the petroleum industry and the war agencies are making special studies of the entire gasoline-supply situation with particular attention being paid to the rationing program. The discussions have brought forth differences of opinion as to what should be done over the remainder of this year and during 1944 but with the hope expressed that after the military requirements have been taken care of there will be sufficient motor fuel available to take care of essential civilian requirements without undue hardships on any particular class of consumers.

IT is said that there is agreement between representatives of the industry and the Government that the civilian-supply situation can be improved with a more equitably enforced rationing program. In regard to any changes it is known that war-production officials have insisted that revisions should be made in such a manner that the manufacture of war products, including farm commodities, will not be affected adversely. The reduction in the B and C coupons was made over the objection of those who felt this action would cause some war workers to quit their jobs. Government reports show that employe transportation to most of the large war plants consists largely of automobiles whose owners have B or C cards.

THE evidence that has been assembled shows that there are many abuses in the supplementary coupons. This includes the gasoline made available for transportation to war plants and in agriculture where the amount of gasoline used is largely left to the judgment of the individual farmer. It has also been contended that the military gasoline use in this country is often wasteful. This includes government employes who travel around the country in cars in connection with their work. The car-pooling plan which was stressed when rationing was inaugurated has fallen short of expectation in conserving gasoline use. It is hoped to close some of these loop holes with a tightening in present rules with the probability of an entirely new program late this year or during the early part of 1944.



Cuts in Western Gasoline Consumption Imminent, Following Eastern Reduction

by Henry D. Ralph

WASHINGTON, D. C.—Two moves were made here in less than a week to "wring all water" from civilian-gasoline consumption in order to free additional volumes for military purposes and to achieve a more equitable distribution of supplies.

The reduction of 33⅓ per cent in value of supplementary mileage coupons in the Middle West and Southwest, effective October 1, was followed October 4 by Petroleum Administrator Ickes' declaration that a cut of 15,000 bbl. in the daily civilian consumption of gasoline in Districts 4 and 5 will be necessary in the near future.

Action of the Office of Price Administration in lowering the value of B and C motor-fuel coupons in all states east of the Rockies to 2 gal. was taken immediately after PAW certified lower quotas of gasoline for Districts 2 and 3 in the fourth quarter. Simultaneously, OPA increased the value of A coupons in the Northeast and Southeast areas to 2 gal. weekly, leaving basic rations unchanged in the other four PAW districts.

Administrator Ickes announced the imminent reduction in gasoline-coupon values in Districts 4 and 5, the bulk of the cut to fall in the Pacific Coast, before a group of some 40 western senators and representatives called to his office October 4.

No date was given for the curtailment, and a representative of OPA said it would be impossible to say how coupon values would be adjusted until PAW certifies the amounts available. An Office of Defense Transportation spokesman added that basic claims for gasoline would contemplate minimum mileage for passenger cars necessary to war activities.

Other Cuts Possible

Mr. Ickes said that the imminent cut in western states is due to an actual shortage of oil which has "reached the point where it is regrettably necessary to say in unambiguous language that there will be less gasoline for civilian use in the West." He added that there may be greater cuts in other parts of the country later. He said the aim is not just to equalize conditions throughout the country but to give the West equitable treatment considering such factors as war activities, density of population and dependence on motor transportation.

The congressmen summoned to Mr. Ickes' office to hear the announcement expressed fear war production would suffer, demanded to know if crude production could be increased, insisted steps be taken to obtain more oil from foreign sources, and agreed that an immediate increase in price of crude is necessary.

Another stimulant to tanker construction is the objective of this new "Tanker Champs" flag which will be awarded each month to the shipyard having the greatest production record. Tankers, a vital link in the global-supply system since outbreak of the war, are becoming even more important in efforts to spread drafts on petroleum to producing countries other than the United States

Deputy Petroleum Administrator Davies said crude production in Districts 4 and 5 is at the maximum rate that will not harm the wells, that no wells are capped and idle, and that there are no restrictions on refining except the availability of crude. The necessity for making war products and the crude shortage, he said, have cut the yield of motor gasoline by 50 per cent. He said curtailment will come from less essential uses, and estimates of essential war demands include agriculture and getting workers to war plants.

Mr. Ickes said efforts are being made to obtain more oil abroad but the tanker fleet is still not up to prewar size and is the chief limiting factor. He said Mexico could not produce much more oil than it needs but as soon as tankers are available some oil will be obtained there. Dr. Robert E. Wilson stated that since expropriation, the Mexican oil industry has been on the decline.

Plans for Venezuela

Messrs. Davies and Wilson said Venezuela production is now between 650,000 and 700,000 bbl. per day and if tankers are available plans are to raise this to 900,000 bbl., with all of it going to the United Nations. United States Atlantic ports are 12 per cent closer to European war theaters than Venezuela and since convoys form here the time saving is much greater and this cannot be corrected until the tanker fleet is much larger, they said.

Mr. Ickes said the Persian Gulf is being drawn on to a greater extent than formerly and that during the past 3 months the whole foreign situation has been improving somewhat as tankers are more available. He said he is satisfied that all that is possible at the moment is being done to increase Arabian production.

Mr. Davies presented a series of charts to show the supply and demand situation in Districts 4 and 5, including these figures:

Minimum safe working stocks of automotive gasoline are 15,000,000 bbl. Stocks now are below 20,000,000 and will reach 15,000,000 in 2 or 3 months and drop sharply after that unless drastic steps are taken. Mili-

tary requirements for gasoline were 23 per cent of the total supply in 1942, are 43 per cent now, and will be 52 per cent in 1944. Production and demand were both about 750,000 bbl. per day in 1941; supply is about 1,000,000 bbl. daily now and for the future but demand will be 1,250,000 by 1944 and is projected much higher. Stocks of crude and products were 170,000,000 bbl. in 1941; are now 130,000,000; minimum safe working level is 100,000,000; at present rate, without curtailment and imports, they will be down to 50,000,000 bbl. by the fourth quarter of 1944.

Military Takes 25 Per Cent

In answer to questions, Mr. Davies said about one-quarter of all oil produced in the United States goes for military uses, and he guessed California would be an importer of oil after the war. He said that every day a price increase is denied means abandonment of more stripper wells but that increased prices would prevent loss of 20,000 to 30,000 bbl. per day production from strippers over a 6-month period.

Senator O'Mahoney declared production from public lands could be increased greatly by more liberal interpretation of leasing and royalty laws by the Interior Department and urged adoption of a program including this relief, and also increased price of crude, government experiments in producing synthetic fuels from coal, and greater development of foreign oil fields in Allied territory.

It was significant that the bulk of questions and comment by congressmen was for increased crude prices and immediate expansion of foreign-oil sources.

Allocations of automotive gasoline for distribution among civilian motorists by OPA were certified September 30 by PAW Ickes as shown in the accompanying table.

"This is all of the gasoline that there is for civilian use in this period," declared PAW Ickes in a prepared statement, "after making provision for the present large and future increasing needs of the military. The allocations include amounts which the ODT has determined to be adequate to protect essential civilian uses and to represent parity distribution of supplies as between areas."

After receiving PAW's certified gasoline quotas, the OPA immediately decreased the value of B and C coupons in Districts 1, 2 and 3 to 2 gal., raised the A coupons in the Northeast and Southeast to 2 gal. and left the basic value of A coupons in Districts 2 and 3 unchanged at 3 gal. It was specified, however, in the new OPA rationing amendment that at least 1 gal. of the basic 3-gal. A coupons in Districts 2 and 3 must be used for occupational driving before car owners would be eligible for supplemental mileage. Thus, the so-called pleasure driving in all states east of the Rockies was reduced to a common denominator of 2 gal. weekly.

LAST-QUARTER MOTOR-GASOLINE QUOTAS FIXED BY PAW
(Figures in barrels daily)

	Agricultural*	Transportation†	Total	Total previous
District 1	29,000	350,000	379,000	342,000
District 2	72,000	395,000	467,000	480,000
District 3	18,000	127,000	145,000	140,000

*Includes essential industrial nonhighway uses certified by War Food Administration and Office of Civilian Requirements. †Certified by Office of Defense Transportation for distribution to trucks, buses and passenger automobiles.

OPA asserted that the Middle West and Southwest, Districts 2 and 3, had been exceeding the PAW quota of gasoline certified in mid-August by approximately 75,000 bbl. daily, despite a 25 per cent reduction in the value of A, B and C coupons.

"Under these circumstances," the OPA statement said, "there was no option but to cut civilians further. It is imperative that all water be squeezed out of supplemental rations and that B and C coupons in the hands of motorists represent only the gasoline they actually need for occupational use.

"We will see that every essential worker with a full car gets to his job. But each request for extra gasoline will be scrutinized closely.

OPA CHANGES IN GASOLINE COUPON VALUES
(Figures in gallons)

Region—	Ration—Old	Ration—New
Midwest, Southwest (Dist. 2 and 3)		
A	3	3
B	3	2
C	3	2
Southeast (N.C., S.C., Ga., Fla.)		
A	1½	2
B	3	2
C	3	2
Northeast (12 states and D.C.)		
A	1½	2
B	2½	2
C	2½	2

"The equalization of rations has long been a goal of OPA. Rationing is sharing—fair sharing of available supplies. Now that additional supplies are being moved into the eastern seaboard, it is only fair to treat alike all citizens under the same circumstances. That is the goal of equalization."

Senators Criticize Petroleum Policies

WASHINGTON, D. C.—Senators back from a round-the-world trip under Army auspices are criticizing the policy of the administration in attempting to supply such a large proportion of the petroleum needs of the United Nations from the resources of the United States, and are suggesting that more oil be obtained from British-owned refineries in the Middle East.

They point out that while the United States has but 25 per cent of the petroleum reserves it is supplying some 65 per cent of the oil used on the fighting fronts, and declared that the British refinery at Abadan, Iran, which they said was the largest in the world, could increase its output by 40 per cent.

Commenting on this at a press conference, Deputy Petroleum Administrator Ralph K. Davies stated that the Abadan refinery is now shipping about 200,000 bbl. of products per day and that a plan is being worked out to increase its deliveries to Allied forces in the Mediterranean area.

Government Consumption in Texas Exceeds Volume Sold to Civilians by 34 Per Cent

AUSTIN, Tex.—Tax-free gasoline sold in Texas during August to government agencies totaled 144,106,049 gal., exceeding the tax-paid volume by 36,484,299 gal., or nearly 34 per cent, according to the state comptroller's figures.

Distributors' reports showed taxes were paid on 107,621,750 gal. in August, compared with 113,474,525 gal. in July and 115,856,346 gal. a year earlier. Theoretically, the tax-paid gasoline represents the volume going to civilian consumers and for agricultural operations.

Total gasoline sales in Texas were 251,727,799 gal. in August, compared with 144,924,798 gal. in the same month a year ago, representing an increase of 73.7 per cent.

While increased consumption of gasoline in Texas has been attributed largely to extremely heavy military demand in the state, recent data released by the National Automobile Dealers Association cast more light on Texas' large demand in spite of rationing. The association reports that as of May 1, 1943, the number of automobiles in Texas had increased by 35,000 or 5.5 per cent, compared with May 1, 1942. Also, in Texas the number of trucks in the state had increased by 18,000 or an increase of 11.5 per cent. It is difficult to appraise the effect on gasoline consumption of these increases in passenger cars and trucks, but it is well known that both truck and bus operations have been widely expanded

Forecast of 22,300 New Wells in 1944 Made at Contractors' Meeting

*by Frank A. Watts**

THERE are two more rotary rigs and one more cable-tool rig drilling today than were in operation yesterday at this same hour. Tomorrow two more rotary rigs and one more cable-tool rig will be in operation than are drilling at this time. Those are statements of fact if the daily average increases in drilling activities which have been maintained since the first of this year are being continued today and will continue tomorrow. If we dealt with fractions, we would actually find that the average daily increase in drilling activities since the first of this year has been slightly more than two rotary rigs and one cable-tool rig. Today, nearly 1,200 rotary rigs are operating in this country, in comparison with slightly more than 700 rigs the first of the year—increase nearly 70 per cent.

Today, nearly 1,400 other than rotary rigs are in operation, in comparison with about 1,200 during January — increase nearly 20 per cent. Today, nearly 2,600 rigs are in operation in comparison with 1,900 the first of the year—increase 36 per cent. These increased drilling activities reflect the petroleum industry's efforts to supply the military's constantly increasing needs for petroleum products. This accelerated program has been and is being conducted in fulfillment of a national responsibility and without the incentive which would result from a general price increase in petroleum.

It has often been stated that more than 60 per cent of all tonnage leaving the shores of this country for one of the theaters of war is petroleum products. Excluding aviation gasoline, more than 1,000,000 bbl. of petroleum products are consumed by the military every 24 hours.

It is because the petroleum industry has performed a remarkable job in supplying these products that it may be depended on to furnish the steadily increasing military needs and to continue to supply the industrial, commercial, farm, and essential civilian requirements. Our military needs have been increasing steadily. As these demands increase, the problem and responsibility of supplying petroleum products backs up through distribution into refining—through that branch of the industry into transportation—and, through it into production, which includes the drilling of wildcat and development wells.

*Director, Materials Division, PAW

Trend of Drilling

In an effort to supply the needs for petroleum products, which have been increasingly military, drilling activities have been stepped up and will be further increased. During the first quarter of this year, 3,653 wildcat and development wells were drilled for the production of oil, condensate, and natural gas. During the second quarter, 4,279 such wells were drilled. It is anticipated that a total of approximately 19,000 wildcat and development wells will be drilled for the production of oil, condensate, and natural gas during this year and that 22,300 or more such wells will be drilled during 1944, in comparison with 18,740 wells drilled during 1942. These figures exclude water input, repressuring, and other wells not drilled as potential producers of oil, condensate, and natural gas.

Nearly 2,600 rigs are in operation today, an increase of 36 per cent since start of the year, it is disclosed in this slightly abridged paper presented this week before the annual meeting of the American Association of Oilwell Drilling Contractors at Houston, Tex. The PAW director of materials pledged ample equipment to prosecute all approved drilling. A companion paper starting on page 47 reports on constructive measures now beginning to function for relief of the acute manpower shortage.

This accelerated program cannot be conducted without materials, and when we realize that this nation's demands for materials currently exceed all available supplies by more than 26 per cent, the problem becomes one which cannot be solved by any simple formula. It is a problem which requires the complete and wholehearted cooperation of all concerned—the producer of materials, the manufacturer, the distributor, the supplier, the production operator, the War Production Board, and the Petroleum Administration for War. These become a seven-man team whose members are playing a materials game which cannot be won without the teamwork of each member of the team. There is strong opposition from many sides facing this team, and the complete cooperation of all members of the team will be required to win the game.

Equipment Time Lag

Demands for materials continue to exceed all available supplies. Army, Navy, Maritime, Air Corps, and other military needs are not decreasing—actually these are increasing. The inventories of production operators and stocks in the hands of suppliers and manufacturers have been decreasing and in many instances have been completely depleted. As mentioned, drilling activities have been increasing steadily, and there is every reason to believe that these activities will continue to increase modestly.

Raw materials — carbon and alloy steel, copper, and aluminum—allotted to manufacturers today will not reach petroleum operators in the form of drilling machinery or items of production equipment for an average of about 6 months. Manufactured items reaching operators today were allotted by PAW to manufacturers as raw materials about 6 months ago. In the interim period, more than 360 additional rotary rigs and more than 180 additional other rigs were placed in operation. No one can predict the exact number of additional rigs which will be placed in operation during the next 6 months and for which carbon steel, alloy steel, copper, and aluminum are at present being allotted by the Petroleum Administration for War.

Generally speaking, materials required for use in drilling and production operations come from producers of controlled materials, who are producing these for the military, and come from equipment and machinery manufacturers, who are

(Continued on Page 42)

THIS WEEK

DRILLING—Producers reassured that equipment will be provided for all authorized exploration and development wells. . . . Rigs now in operation total 2,600, up 36 per cent from start of year. . . . Forecast of 22,300 new wells in 1944 made before drilling contractors' annual meeting in Houston. . . . ¶Spacing restrictions modified in 12 southwestern Michigan counties, grading down to 10-acre locations, to stimulate production in acutely short refining center. . . .

REFINING—West Coast manufacturers instructed to de-emphasize production of premium automotive fuel, concentrate on aviation-base stocks and 80-octane all-purpose military gasoline. . . . ¶District 2's October quota of motor-fuel shipments to East Coast reduced to 129,000 bbl. daily, was 151,000 bbl. in September. . . . Individual refiners relieved of specific assignments, problem left for industry to handle. . . . ¶Residual fuels continue to stack up in most plants, forcing radical adjustment of operations. . . . ¶Contract for aviation-gasoline facilities at National Refining Co.'s Coffeyville, Kans., plant increased $1,660,000. . . . ¶Richfield Oil Corp. starting $13,000,000 California plant for Defense Plant Corp. . . .

SUPPLIES—Total motor fuel available for civilian distribution in Districts 1, 2 and 3 certified at 962,000 bbl. daily during final quarter, off 29,000 bbl. from previous PAW quota. . . . Shortage of 15,000 bbl. daily predicted in Districts 4 and 5 motor-fuel supply in near future. . . . Imminent cut in civilian consumption to be concentrated on Pacific Coast. . . . Efforts discontinued to convert oil-burning equipment to coal. . . .

RATIONING—All B and C coupons east of Rockies reduced to common value of 2 gal. . . . Basic A coupon values on East Coast raised to 2 gal. weekly, left unchanged at 3 gal. in Middle West and Southwest. . . .

FOREIGN—Mexico makes final payment of $1,500,000 to Sinclair Oil Corp., completing agreement totaling $8,500,000 for the company's properties expropriated in 1938. . . . First payment of $3,796,391.04 made by Mexico to U. S. State Department on negotiated settlement of claims by other expropriated American companies. . . . Out of total of $29,137,700.84 due by September 1947, Standard of New Jersey subsidiaries will get $22,332,484, including interest. . . . ¶PAW reports Venezuelan production averaging 650,000 bbl. daily, discloses plans for increasing output to 900,000 bbl., if tankers can be made available. . . .

TRANSPORTATION—Contracts awarded for Magnolia Pipe Line Co.'s 337-mile 12-in. crude-oil line from Midland to Corsicana, Tex. . . . Construction to start later this month. . . . ¶Fewer than 285 miles of 20-in. remain to be laid east of Seymour, Ind., to complete WEP products line. . . . ¶PAW issues directive on WEP product-line operation, restricting it to service of supplying East Coast shortage area and offshore movement. . . .

A section of the pipe line to Canol camp across a Yukon lake. The censor-approved caption does not qualify the type of line but the timber trestle is a far cry from the modern pipe-line bridges in the more completely developed transportation system of the industry in this country. Expenditures on the Canol (Canadian oil) project are under criticism by the globe-girdling committee from the Senate

Wide World Photos

PAW Broadens Regulations Over Petroleum Shipments to District 1

WASHINGTON, D. C.—Regulations governing distribution of petroleum products imported into District 1 were broadened last week by the PAW to include certain new movements which were not embraced by Directive 59. Objective of the new regulation (Petroleum Administrative Order 5, amended), according to PAW press releases is to obtain more efficient distribution of products to meet the differing impacts of the war on East Coast consumers and supplying companies.

Coordination of all shipments of principal petroleum products by all importers in PAW District 1 so that all supplies may be directed to the points where they are most needed is made possible, PAW explained, by the new order.

"Until recently," Administrator Ickes said, "more than 95 per cent of all supplies on the East Coast have been strictly scheduled and allocated under the provisions of Directive 59 to meet industrial and civilian demand. Other movements, however, are now being made increasingly without regard for the critical needs of certain parts of the district, and this order (PAO 5, amended) requires that approval be obtained for all receipts not scheduled under Directive 59.

"Every gallon of petroleum must be scheduled to meet equitably the demands of the district as a whole. There can be no justification for allowing excess petroleum in one part of the district while another part is out of oil."

Approval Required on Imports

Outlining the provisions of the order, Deputy Administrator Ralph K. Davies explained that any one who imports principal petroleum products into District 1 is required to obtain approval for all receipts except those already specifically covered in the regular monthly schedule prepared under Directive 59, under which the PAW supply program is administered. Receipts appearing on Directive 59 schedules do not require further approval.

"Approval of other receipts will be granted freely," Mr. Davies said, "provided that the importer shows that the product is needed at the proposed destination in relation to other areas within the district, and that the importer will pay to the Defense Supplies Corp. the amounts of the revenue price increases granted by the OPA for the purpose of offsetting in part the increased cost, due to the war, of transporting petroleum to the East Coast."

Applications for approval of proposed receipts must be made to the director-in-charge, District 1, 1104 Chanin Building, 122 East 42nd St., New York. District 1, to which the order applies, consists of the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida and the District of Columbia.

Rivers Subcommittee Hears New Testimony Favoring Price Rise

WASHINGTON, D. C.—Further testimony that price of crude oil should be increased was heard by Representative Rivers' subcommittee of the House naval affairs committee October 4. Witnesses were J. E. Brantly, president of the Drilling & Exploration Co., Inc., Dallas, Tex.; Beauford H. Jester, chairman, Texas Railroad Commission, and J. C. Hunter, president, Mid-Continent Oil & Gas Association.

Mr. Jester said a recent study by the commission shows Texas can produce without waste 175,170 bbl. per day more than the 1,999,000 bbl. PAW certified for October, and for about 6 months it could step up its production another 50,485 bbl., or a total of 2,225,655, and crowd the safety limit. But he said that even at this top figure, and with maximum production from all other domestic fields, the country will still be 500,000 bbl. per day short of the 1944 anticipated peak demand, while, because of decreased refinery yields of motor gasoline, we need 22 per cent more crude than otherwise.

He said the only way to increase production is by more wildcatting and cited many historical figures to show that price of crude has a direct bearing on the amount of wildcatting. Quoting commodity price index figures, he said the OPA policy of trying to hold the line on prices ignores the fact that crude prices are far below that line.

All three witnesses insisted that crude is now selling below its replacement cost and that if, as OPA insists, some producers are showing a profit, it is because they are liquidating their business.

Mr. Brantly said a recent agreement by the War Manpower Commission assures obtaining necessary labor for additional drilling and he was assured steel would be available to drill 25,000 wells in 1944, but if there is no price increase most of these will be in proven fields and there will be little wildcatting.

Mr. Hunter gave a historical explanation of why crude prices were abnormally low and about to rise just when OPA froze them at less than replacement costs.

Meanwhile, Sen. Elmer Thomas introduced a bill to require OPA to increase the crude price ceiling by at least 35 cents per barrel with compensatory adjustments in products prices.

Spacing Restrictions Modified in Michigan

CHICAGO, Ill.—Spacing restrictions were modified last week in 12 southwestern Michigan counties, permitting 10 and 20-acre locations for shallow wells to 1,400 ft., and to 2,500 ft., respectively. Formal action was announced in Washington, D. C., with issuance of an amendment to Supplementary Order 7, Petroleum Administrative Order 11, effective October 2.

The supplementary order applies in Allegan, Barry, Berrien, Branch, Calhoun, Cass, Kalamazoo, Kent, Muskegon, Ottawa, St. Joseph and Van Buren counties.

An oil well may be drilled on a 10-acre tract, provided the well does not exceed 1,400 ft. in depth. Previously the order established a 20-acre spacing pattern for wells of 2,000 ft. or less.

If an oil well is drilled to a depth of 1,400 to 2,500 ft., a 20-acre spacing pattern will prevail.

The 40-acre spacing pattern will apply to all wells drilled to depths greater than 2,500 ft. This provision will not affect present operations however, since no fields in the affected countries produce at those depths.

Now, a well may be drilled at a point 300 ft. from the nearest unconsolidated properties. Previously, a 330-ft. minimum prevailed.

Texas Hearing Called October 19 at Austin

AUSTIN, Tex.—The regular statewide proration hearing will be held in Austin October 19, it was announced last week by the Railroad Commission. Purchasers have been notified to file their nominations for crude prior to the meeting.

Improvement in Tanker Efficiency Disclosed by Third Naval District

NEW YORK.—The vast improvement in tanker transportation was revealed by Comm. Frederick Reinicke, port director, third naval district, in a talk before representatives of 14 oil companies in New York Monday. He stated that only one tanker in every 30 now misses her convoy, whereas before 1 in 4 failed to meet operation schedules for one reason or another.

He praised the record of marine and terminal operators for fueling and operating tankers which "is equal to that of any defense plant in the country and one of which you may be proud." He noted the new submarine campaign launched by Germany but said that the favorable side of the argument is undeniably ours.

"We have reached the point where new shipping exceeds the losses many times. At present we are turning out about 17 new tankers each month. In about a month this rate will be speeded up to a point where we will be averaging one tanker every day in the year," he said.

The enormity of the oil-supply problem was shown, he said, by the fact that in one typical day of all-out operations in the European theater 42,000 tons of petroleum were consumed.

Three members of the British Petoleum Board were present.

Also disclosed Monday was the fact that a Norwegian tanker owned by Texas Co. has completed 45 war crossings while 40 per cent of her sister tankers were lost. This tanker, diesel-powered, was completed in Hamburg, Germany, in June 1939, by Germans with German equipment and material. It has a speed of 14-15 knots and carries 14,000 tons of aviation gasoline. T. E. Buchanan, Texaco marine superintendent, said it has carried enough gasoline for 39 raids by 500 planes with enough left over for 1 week's supply for 900,000 cars in the East.

Pike Confesses "Boner" On Import Statement

SUMNER T. PIKE, chief of the petroleum-price division, Office of Price Administration and a member of the Securities and Exchange Commission, confessed last week that he was guilty of a "boner" in replying to a question at a Senate subcommittee hearing on September 20.

In a letter to the Journal dated September 30, Mr. Pike said:

"This is to confess my prize boner at the hearings before a subcommittee of the Senate committee on agriculture a week ago Monday. I just plain misunderstood Senator Bushfield's question as to whether we might import a billion barrels of oil next year from South America. I thought he was asking as to whether there shouldn't be an increase in imports and didn't get the size of the figure at all. It was pretty shocking to see such a reply in the cold type of the record and I have requested that, with Senator Bushfield's permission, the record be changed. My face is pretty red."

Senator Bushfield of South Dakota, a member of the committee, told Mr. Pike that he understood plans called for importing 1,000,000,000 bbl. of oil next year. Mr. Pike replied that this sounded "logical."

The Journal's report of the hearing on page 84 of the September 23 issue pointed out that imports of 1,000,000,000 bbl. would be at the rate of 2,700,000 bbl. daily, leaving the obvious conclusion to the reader that such a rate of production and shipments was completely illogical. On page 79 of the September 30 Journal it was pointed out that 1,000,000,000 bbl. was approximately 400,000,000 bbl. greater than the total world production outside this country.

Depletion Attack Appears Unlikely

WASHINGTON, D. C.—Elimination of the oil-well depletion allowance in computing federal income taxes, apparently is a dead issue at the present.

Robert L. Doughton, chairman of the House committee on ways and means, has announced that the committee will hold no hearings on the subject of depletion allowances when it considers the forthcoming new revenue bill. The ruling out of depletion allowances, along with several other revenue proposals which have been the subject of controversy for several years, indicates that the matter will not be given any consideration at least until Congress begins a general revision of the administrative provisions of the revenue laws, tentatively scheduled for some time next year.

During the framing of the last revenue law the House committee held extensive hearings on depletion. The Treasury attacked the present act severely, but the committee declined to make a change and the Senate took the same position when it considered the bill. Many oil producers have been fearful that the issue might be raised again and this has been mentioned as one of the hindrances to greater exploration.

Refiners to Discuss Sour-Crude Processing

"The Refining of West Texas Crude" will be discussed in a paper by Baxter I. Scoggin, manager of research and development for Anderson-Prichard Oil Corp. of Oklahoma City, Okla., before the Western Petroleum Refiners Association at the Mayo Hotel, Tulsa, October 12 at 3 p.m. The Anderson-Prichard refinery has been operated on both Mid-Continent sweet and West Texas sour crudes.

All refiners are urged to bring up questions on handling sour crudes which they may wish to have answered. Charles H. Alberding, Chicago, refining director for District 2, PAW, will be present to answer refiners' questions on this and other subjects in which they are interested.

Some of the questions which are expected to be answered are those relating to safety to personnel in handling sour crudes, mixing sour and other crudes, treating costs, alloys required for sour-crude processing, sulfur content and sulfur-removal methods.

Texas Commission Fights Marginal-Well Statute

AUSTIN, Tex.—The Texas Railroad Commission last week continued its fight to establish its oil-water ratio rules in East Texas on a legal basis to take precedent over the so-called marginal-well law. Gillis Johnson, Fort Worth, Tex., special counsel for the commission, argued here before the Third Court of Civil Appeals that the litigation should be fully reviewed.

Fred Weeks, attorney for Konowa Operating Co., an East Texas producing company, won a judgment in the lower court. The trial court held the order limiting water production in the East Texas field to 5 bbl. for each barrel of oil invalid as in conflict with the marginal-well law.

The Railroad Commission appealed. While the appeal was pending, Mr. Weeks filed a motion to dismiss the entire case, as his client is complying with the ratio order and no longer wants to contest it.

Mexico Accepts Terms of Payment for Oil Properties of American Nationals

by Henry D. Ralph

WASHINGTON, D. C.—The second and final step in settlement for the oil-property expropriated by Mexico was taken here last week when the manner and conditions of payment of compensation for the benefit of American nationals were accepted by representatives of both governments.

Terms of the settlement negotiated by the U. S. Department of State are:

The amount due is $23,995,991 plus $5,141,709.84 interest at 3 per cent per annum on all unpaid balances from March 18, 1938, to September 30, 1947, the date set for final payment, a total of $29,137,700.84. After deducting the $9,000,000 deposited in cash by the Government of Mexico at the time of the signing of the agreement of November 19, 1941, the balance due is $20,137,700.84.

The balance is to be paid in the following installments: $3,796,391.04 on September 30, 1943, and the balance in four equal annual installments, each of $4,085,327.45.

Acceptance of manner and conditions of payment for oil properties expropriated from American nationals reported in this story apparently terminates claims of private companies against Mexico.

The first installment was paid September 30 by Ambassador Francisco Castillo Najera who handed another check for $1,500,000 to Harry F. Sinclair, head of the Consolidated Oil Corp., at New York, in final settlement of that company's separate agreement. The Sinclair company accepted total payment of $8,500,000 for its properties in Mexico and has been receiving payments over the past 2 years.

The agreement negotiated by the State Department in behalf of American nationals other than the Sinclair company provides that subsidiaries of Standard Oil Co. (New Jersey) will receive a total of $22,332,484, including interest. Value of the properties expropriated from the Jersey Standard's Mexican subsidiaries was fixed at $18,391,641. Interest amounts to $3,940,843. The remainder of a little less than $7,000,000 is divided among the several other American companies, including a primary award of $3,589,158 to the Standard Oil Co. of California group.

The general predicate for settlement of the petroleum expropriation issue was established November 19, 1941, in an exchange of notes between the two governments. Morris L. Cook, Pittsburgh, Pa., was appointed to represent the United States and Manuel J. Zebada for Mexico.

Engineers Make Appraisal

The two engineers appraised the expropriated properties and recommended the settlement that is now implemented by the stipulation on manner and conditions of payment.

The settlement with American oil companies does not involve claims of subsidiaries of the Royal Dutch-Shell group which included the valuable concessions at Poza Rica. The British Government has declined to sponsor a negotiated settlement and, presumably, continues its original stand that nothing short of return of the properties will be satisfactory.

"After we had exhausted all legal remedies in an effort to secure a settlement," Standard of New Jersey said in a formal statement, "the United States Government undertook negotiations with the Mexican Government for the purpose of settling all claims of American oil companies affected by the expropriation."

Acme

Adolphe Berle, assistant secretary of state, receives a check for $3,796,391.04 from Ambassador Francisco Castillo Najera as the first payment in settlement of expropriation claims by American oil companies. Don Salvador Duhart, first secretary of the Mexican embassy witnesses the transaction

Atlantic Purchases Conroe Property

HOUSTON, Tex.—The Gulf Coast Drilling & Production Co., headed by Albert Plummer and D. B. McDaniel, of Houston, sold to Atlantic Refining Co. its leases and 31 oil wells and 2 gas wells in the Conroe field of Montgomery County. Consideration was reported at more than $5,000,000 cash, plus an oil payment.

FOUNDED IN 1910

BY PATRICK C. BOYLE

the OIL AND GAS JOURNAL

Giving the "Low-Down"

THE action of 66 companies in giving millions of users the "low-down" on gasoline rationing in District 2 should be the start of a nation-wide and industry-wide program of keeping consumers advised of what is happening in the distribution of petroleum supplies.

We are confident that this one advertisement appearing in 103 middle western and other District 2 newspapers was worth more in explaining the why of the motor-fuel restrictions than all of the official explanations of the past 6 months.

The statement was comprehensive. It made sense. It placed all the cards on the table as to the immediate causes of rationing. The fact that there were more than 60 signatures impressed many consumers who think of the petroleum industry as a monopoly controlled by a few companies.

The entire petroleum industry will benefit from this frank and factual explanation—now and later. Furthermore, it will bring support for the war effort from those who have never been able to add up the Washington releases in terms of what was happening to gasoline at the filling stations.

In establishing this mutual confidence between producers and consumers the program should not stop with one subject nor should it be confined to one area. Away from the oil country the universal question is "Is there really an oil shortage?"

Back of that question is misinformation or no information at all. The consumer has heard that the "big oil companies are holding back until they get higher prices," that "no one pays any attention to rationing in the oil states" and "there is plenty of oil and rubber" but that "the Government is limiting supplies to force people to buy more bonds" or "to make them more war conscious."

These viewpoints could be treated as jokes if the implications from the standpoint of the war and to the petroleum industry were not so serious.

Consumers will accept the truth in these matters. They are not unfriendly to the oil business despite the insistence of political opportunists to the contrary. They know that gasoline is practically the only commodity that they are buying at prewar prices and they will not object to reasonable advances provided the need is shown.

They know in a general way that the petroleum industry has tremendous responsibilities in this emergency. If properly presented, they will be impressed with the details of what has been done and what is required in basic oil operations to support these essential war activities.

The public can be told in language it can understand the importance of finding enough new oil to keep pace with that which is being produced and consumed. It will realize that in insisting on better prices, additional materials, and more consideration in manpower, the winning of the war and the peace is the objective which motivates the petroleum industry at this time.

Information should be presented briefly and factually. Care should be taken not to cover too much ground in one presentation. Statements of the type which the public has learned to identify as "propaganda" and "official hokum" should be carefully avoided.

A start has been made at several points in better public relations for petroleum. There never was a more opportune time than now for the oil industry to present its case in full.

Forecast of 22,300 New Wells in 1944

(Continued from Page 36)

manufacturing equipment for the armed forces under war contracts. During the latter part of 1941 and during the early part of 1942, the more than 400 companies who were manufacturing equipment used primarily in the petroleum industry converted the major portion of their facilities to the production or manufacture of military items. Relatively small portions of their facilities were reserved for the manufacture of items required in petroleum-production operations. These manufacturers are to be commended for their voluntary and aggressive participation in our war program.

Drilling and production activities outside the United States are being stepped up at about the same rate domestic operations are increasing. Materials required for foreign operations are increasing at about the same accelerated rate as are needed for domestic operations.

The Production Operator

Before completion, the average wildcat and development well drilled for the production of oil, gas, or condensate requires the use of approximately 64 tons of carbon steel, 11 tons of alloy steel, 180 lb. of copper and copper base alloys, and 4 lb. of aluminum. These amounts are arrived at by dividing the number of wildcat and development wells currently drilled as potential producers of oil, condensate, or natural gas into the amounts of controlled materials allotted to production operators and petroleum-equipment manufacturers.

It becomes increasingly necessary for the production operator to plan his operations as far as practical into the future and, as soon as definite plans are made, to order all materials for which there are known needs. Although Preference Rating Order P-98-c permits the production operator to maintain a 90-day inventory, greater stocks than those for which the operator has a known need should not be acquired. Although the PAW Materials Redistribution Program 2 requires the reporting and redistribution of surplus material, an operator should cancel or advance the delivery date on purchase orders as soon as it is determined that the material being ordered will not be required when received or would create surplus material if received.

Operators should not file WPB-2565 applications for larger allotments of controlled materials than they believe they will require for actual use. Delivery orders for controlled materials should be placed as soon as possible after allotments are received. As soon as it is determined that a portion of the allotment will not be required by the operator, the district offices of PAW should be promptly informed to enable them to make the material available for some other production operator. After allotments have been received and delivery orders placed by operators, and changes in operations or other conditions make it necessary to cancel a portion or all of a delivery order, PAW should be immediately notified in order that this material may be made available for allotment to other production operators.

Sufficient — but only sufficient — materials are being made available to PAW to allot to production operators for the necessary conduct of drilling and production operations. To the extent that allotments are not used or materials are not acquired for use by production operators, to that same extent the petroleum industry is deprived of the use of material. It is necessary that all production operators fully appreciate this fact and cooperate in the realization of an objective of converting into usable items of materials all controlled materials which are allotted by PAW for production operations. It is far better to file supplemental applications for controlled materials and to have these converted into usable items of material than it is to permit any portion of an unused allotment to die in an operator's files and not be converted into an item usable in drilling and production operations.

Commencing with the first quarter of 1944, all WPB-2565 applications will be processed in the district offices of PAW. These will thereby receive uniform consideration and the promptest possible attention. Mill and field stocks of oil-country tubular goods have been established and are being maintained to fill orders of operators who were unable to place delivery orders far enough in advance to obtain delivery from regular mill rollings. These stocks are being conservatively used to fill emergency orders.

To the extent operators are able to plan their operations, and determine their needs for material, they should keep their suppliers informed about their plans and production program. Information thus accumulated by suppliers will assist them in maintaining stocks required for the accelerated drilling program. Pipe mills and other producers of controlled materials, petroleum equipment manufacturers, oil-field supply companies, and distributors will be able to do a better job of maintaining a manufacturing and inventory-replacement schedule if they are kept well informed.

Because there is a continuing scarcity of critical materials, it is just as necessary today as it was during the past 2 years that less scarce materials be substituted for more critical materials. Old machinery and equipment should be repaired and retained in service just as long as possible. The petroleum operator has been using his well-known ingenuity along this line, and it is just as necessary as ever that a sound maintenance and repair program be continued. Obsolete and worn-out equipment can be replaced after the war has been won.

The Oil-Field-Supply Company

The production operator has always relied, and must continue to depend, on the oil-field-supply company to maintain an adequate stock of the myriad of shelf items which are currently required in production operations. Far less material is tied up in inventory when these stocks are carried by supply companies than would be necessary if every production operator was required to maintain his own stocks. If the 368, more or less, oil-field-supply companies do not provide a program which will make available to the production operator an adequate supply of new equipment, and repair parts for old equipment, then the supplier will have failed to fulfill his obligations to the petroleum industry. Suppliers' stocks were depleted during the past 2 years and are now at extremely low levels. Many suppliers are completely out of certain items. Stocks of other items are critically low. Nearly all suppliers have a stock of some items of material which are more or less obsolete and which are being used by operators in emergencies. Even the stocks of obsolete material have become pretty well depleted.

With the long lead time between the day the supplier places an order for material and the day the manufactured item is received by the supplier, he is naturally confronted with a problem of supplying shelf items for a deferred drilling program, which is accelerating at an unknown rate. That, however, is the supplier's responsibility, and he must assume it.

PAW has endeavored to make available to production operators preference ratings which are high enough to enable the suppliers to replace items sold to petroleum operators. Because requirements are increasing and it is only possible to extend these ratings to replace material sold, suppliers must use other means to acquire initial inventories or to build up an inventory large enough to provide for an accelerated program. Material which is required beyond that which may be acquired by extending the ratings received from production operators may be secured by the suppliers' filing PD-1X applications with the War Production Board. A Petroleum Supply Section of the War Production Board was recently formed to process and expedite these applications for the supply companies. It is the responsibility of this group to work with the supply companies in making available, for their use, pref-

erence ratings which are high enough to guarantee delivery of the items of material covered by the applications. The suppliers must file these applications as far as practical in advance of the time the material is actually required for use and must limit the applications to their minimum requirements. They must then demand preference ratings high enough to obtain delivery of the material by or in advance of the time the material is required for use in the petroleum industry.

Petroleum-Equipment Manufacturer

The 400 plus petroleum-equipment manufacturers who depend on PAW both as a claimant agency and as an industry division obtain from PAW allotments of controlled materials and preference ratings for use in acquiring components required in the manufacture of drilling machinery and production equipment required by production operators. During the past 1 to 2 years, these manufacturers have used the majority of their manufacturing facilities for the filling of war contracts. It has therefore become difficult for these manufacturers to fill petroleum industry orders for an accelerating drilling and production program.

Since the petroleum program must be met, it is necessary that these equipment manufacturers rearrange their programs or facilities to enable them to supply their portion of the petroleum industry's needs for new equipment and repair parts for old equipment.

Controlled-Material Producers

The principal items of controlled materials acquired by production operators are casing, tubing, drill pipe, line pipe, standard pipe, and wire line. Plates, tubes, copper wire, and other items are required occasionally. Tubular goods, however, represent the principal item of controlled material required by production operators. The program which has been worked out between WPB, PAW, and the pipe mills, with the complete cooperation of WPB and the pipe mills, has resulted in tubular goods being made available for petroleum industry use at a rate which is equal to the industry's need for these materials.

It becomes increasingly necessary that production operators file applications for no more controlled materials than they believe will be required for use and that they file these applications as far as possible in advance of the time delivery is required. As previously suggested, it is necessary that allotments which are in excess of the operator's requirements be returned to PAW at the earliest possible moment after it is determined that they are not required. When a change in operations or other circumstances make it necessary to cancel or reduce a delivery order, PAW should be furnished with the facts. Allotments made available to production operators must be acquired by operators in the form of controlled materials or returned to PAW and made available for other operators, or they will be forever lost to the petroleum industry. There must be complete PAW-production-operator cooperation on this level.

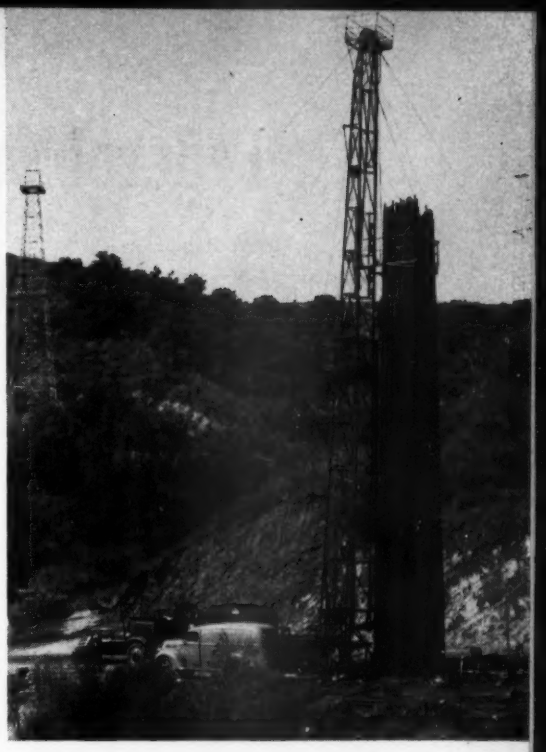
As long as operators plan their operations as far ahead as they are now doing, it appears that it will be possible for the producers of controlled materials — particularly oil-country tubular goods—to fill orders for these by the time, and to the extent, they are required for use in the drilling of wildcat and development wells.

The Equipment Distributor

There is a long lead time between the day a delivery order is placed for the average item ordered through a distributor and the day the item is delivered by the manufacturer through the distributor for use in the petroleum industry. It thereby becomes the responsibility of the distributor to keep well informed on petroleum industry operating and requirement trends and to keep in touch with petroleum operators. This will enable the distributor to program the delivery of new equipment and repair parts for old equipment so these may be available to petroleum operators at the same time the items are required for use. The distributor must initiate, sponsor, and pursue whatever program seems necessary to provide a flow of manufactured items and repair parts at a rate which is equivalent to the petroleum industry's needs for these.

Because nearly all of the 14 claimant agencies require the same items of material the petroleum industry acquires through distributors, it is most important that they provide a sound, just, well-balanced, and adequate program for the acquisition and distribution of items of material for petroleum industry use. After a program has been formulated and orders placed, it is the distributor's responsibility to stay in there and fight to adequately provide for the petroleum industry's needs for the new manufactured items and for repair parts for old equipment.

It is the responsibility of the War Production Board to analyze and balance the needs of each claimant agency and the industries or operations represented by each claimant agency and then to bring into balance over-all supplies and demands for materials. It is because there is a growing realization that military and other essential needs for petroleum products are steadily increasing, while petroleum reserves are steadily decreasing, that the representatives of the War Production Board are seriously endeavoring to make available for petroleum industry use all materials actually required.



This portable rotary rig operating in a California field is symbolic of the increased rate of drilling operations necessitated by the industry's efforts to meet the constantly rising demand

When a justified need for material is well presented, or reasonably well presented, to the War Production Board, we can depend on the materials being made available. These needs must be presented reasonably well in advance of the time the materials are required for use.

Petroleum Administration for War

Every team must have one member capable of withstanding the shocks and leading the fight for, or supporting the fight of, the other members of the team. PAW must assume and dispatch that role. It is PAW's responsibility to estimate, with the cooperation of the members of the petroleum industry and other affected or interested parties, the petroleum industry's future needs for materials and to present and defend these needs before WPB directors and industry divisions. PAW must assist in scheduling the delivery of these needs by or before the time the materials are required for use. If inadequate quantities of materials are being made available for petroleum operations, then PAW must take whatever steps are necessary to supplement the supplies and make them adequate. If preference ratings, available for use by operators, are lower than required to obtain delivery by the time the materials are required for use, then PAW must take whatever steps are necessary.

Federal Order Digest

PAW Regulations

Refining — Special directive: Instructs West Coast refiners to decrease output of premium gasoline in order to increase production of aviation and 80-octane all-purpose military fuel, issued October 1.

Processing—PAO 16: Covers control over delivery, use and refining of petroleum sulfonates, replaces War Production Board Order M-188, effective October 1.

Motor Fuel—PAO 17: Lifts ban on shipment of motor fuel from Washington and Oregon into Idaho, supersedes and replaces WPB L-70, issued September 30.

Gasoline Quotas — Third-quarter certification: Allocates 379,000 bbl. daily to District 1; 467,000 bbl. to District 2, and 145,000 bbl. to District 3, issued September 30.

Well Spacing—PAO 11, SO 7: Permits closer spacing in 12 southwestern Michigan counties as follows: 10 acres up to 1,400 ft.; 20 acres, 1,400 to 2,500 ft. and 40 acres, below 2,500 ft., issued October 2.

Distribution—PAO 5, amended: Requires approval from PAW's District 1 director for import of principal petroleum products into eastern states, except as otherwise covered by Directive 59, issued September 28.

Fuel Oil — Conversion announcement: Suspends program for conversions of industrial and commercial oil-burning equipment to use of coal, issued September 23.

OPA Rationing Orders

Motor Fuel—RO 5c, Amendment 75: Permits members of armed forces to use certification of a post transportation committee to obtain C gasoline rations for necessary driving between residences and posts of duty, effective October 4.

Gasoline—RO 5c, Amendment 77: Lowers value of B and C coupons in all states east of Rockies to 2 gal., raises A coupons in eastern states to 2 gal. weekly, effective October 1.

Tires—RO 1a, Amendment 51: Removes used tractor and implement tires from rationing restrictions, effective October 2.

OPA Price Actions

Crude Oil—Authorizes 20-cent advance in ceiling price of Franklin heavy-sand production, Venango County, Pennsylvania, retroactive to May 17, issued October 4.

Used Pipe—RMPR 230, interpretation: Permits seller of used iron and steel pipe in the ground to charge ceiling price for "reusable" pipe less cost of lifting and reconditioning, and loading it on railroad cars or trucks, issued September 28.

Steel Valves — GMPR, RO 23: Changes method of establishing prices and freight charges applicable to the sale of new steel valves by the Metals Reserve Co., placing obligation for shipping charges on MRC, effective October 1.

Contaminated Petroleum—Rev. SR 11, Amendment 36: Exempts reconditioning of contaminated petroleum products from ocean-going vessels from price control, effective October 4.

WPB Priority Orders

Laboratory Chemicals—PRO P-135 and P-135-a, amended: Reassigns preference ratings on deliveries of reagent chemicals for laboratory use. Rating of AA-1 assigned to laboratories having serial number and AA-2 to those without serial number, issued September 28.

Steel Tubing—LO L-126, Schedule 3, amended: Extends specifications for coil or tube assemblies for refrigeration condensers or coolers to January 1, issued September 28.

Steel Drums—LO L-197, amended: Provides more positive control over the distribution and use of steel drums, and excludes numerous products from packaging in these containers, issued October 2.

Policy Statement — Continues the restriction on construction of new facilities and reduces facilities under construction to the minimum necessary to the war program and essential civilian needs, creates Facilities Committee, headed by Donald D. Davis, WPB vice chairman.

Idaho Shipments Again Permitted From West

WASHINGTON, D. C.—PAW prohibition on the movement of motor gasoline from Washington and Oregon into Idaho was removed last week, thereby reestablishing normal distribution in the Northwest territory.

Petroleum Administrative Order 17, the instrument through which the restriction on Washington-Oregon shipments of gasoline to Idaho were removed, embodies all other provisions previously contained in WPB Limitation Order L-70 which has been revoked.

By removing the restriction on shipments from Washington and Oregon, the comparatively small demands for motor fuel in western Idaho can again be supplied in an efficient and economic manner, PAW said.

PAW Takes Over Control of Petroleum Sulfonates

WASHINGTON, D. C.—The Petroleum Administration for War last week issued Petroleum Administrative Order 16, replacing the provisions of War Production Board Order M-188 under which allocation controls are maintained over the delivery, use and refining of petroleum sulfonates.

Petroleum sulfonates, which result from acid treating of certain petroleum fractions, are essential in the manufacture of a number of highly critical war products, such as cutting oils, grinding compounds and lubricant additives.

The new Petroleum Administrative Order follows the old War Production Board Order very closely, but some changes of wording and arrangement have been made, principally for the purpose of clarifying points where experience indicated this was advisable. Forms to be filed under the new order are exactly the same as heretofore.

Operating Plan Issued For 20-in. Products Line

WASHINGTON, D. C.—The 20-in. products pipe line now being constructed between Texas and New York will be operated exclusively to make deliveries to the East Coast shortage area and for offshore shipments, it is declared in Petroleum Directive 73 issued by the Petroleum Administration for War.

The directive instructs War Emergency Pipelines, Inc., to operate the line in accordance with monthly schedules established by PAW, including sources of supply and disposition of all products moved. The plan of operation is similar to that now being used for the 24-in. crude line, and makes the new pipe line a private carrier operated by the Government exclusively for war purposes.

Franklin Pennsylvania Crude Ceiling Increased

WASHINGTON, D. C.—The Office of Price Administration this week raised the ceiling of Franklin heavy-sand crude oil in Venango County, Pennsylvania, by 20 cents per barrel to $3.63, retroactive to May 17, 1943.

Examination by OPA accountants showed clearly that producers were operating at a loss. The only two refiners purchasing this crude agreed to absorb the increase.

Drilling-Labor Outlook Aided by Government-Industry Program

*by Samuel E. Hill**

Establishment of uniform wage brackets for drilling personnel in Districts 2, 3 and 4 and a system for recruitment of oil-field workers attracted to other industries are the main steps outlined herein for relief of the manpower shortages. This slightly abbreviated paper, with that by Frank A. Watts starting on page 36, reports tangible measures for mitigating influences stifling drilling. It was delivered this week at Houston, Tex., before the American Association of Oil-well Drilling Contractors.

THE general outlook with respect to manpower problems has been clearly indicated by recent events. They point to further over-all shortages, as well as increasingly critical shortages of skilled labor throughout the country and of common labor in the so-called critical labor-market areas.

The manpower problem of oil-well drilling contractors has been made particularly acute by reason of the curtailment in drilling operations which took place in 1941 and the first part of 1942 due to shortages of materials and other factors.

As you know, the requirements of the armed services have necessitated an increase in petroleum production. In consequence, the Petroleum Administration for War has called for a substantial increase in drilling operations.

In an endeavor to meet the problem, officers of your association consulted with PAW and with representatives of other government agencies affected and succeeded in developing a three-point program designed to eliminate barriers standing in the way of the necessary expansion in employment. The program involved stabilization of wage rates, proper scheduling of drilling operations to insure continuity of employment, and establishment of central recruiting machinery for dealing with the War Manpower Commission on the problem of return to the industry of employes who had taken up other kinds of work during the contraction in drilling operations.

Wage Differential Unsatisfactory

Operating under its directive to establish wage brackets by areas for the various occupations in each of the principal industries, the Eighth Regional WLB established wage brackets for the petroleum industry intended to reflect sound, tested, going rates. In so doing, the regional board divided the region into three zones and established different brackets for each zone. In view of the fact that drilling contractors must move rigs and crews over considerable distances, it immediately became apparent that this action on the part of the regional board would give rise to various difficulties. Accordingly, the PAW and representatives of your association recommended to the chairman of the Eighth Regional Board that uniform wage brackets be set for persons engaged in oil-well drilling operations. Eventually this matter was referred to Washington and a panel was appointed by the national board to consider the question.

As a result of the panel's recommendations, the National War Labor Board resolved on September 28 that uniform wage brackets be established in the entire area comprising PAW Districts 2, 3, and 4, with the exception of the State of Ohio, and the addition of Florida and Georgia. The following minimum hourly wages have been set for drilling contractors' employes:

Drillers, $1.50; derrickmen, $1.10; enginemen and firemen, $1.05; floormen and roughnecks, 99 cents.

The job classifications covered are the same as those shown in the Manual of Job Classifications, Definitions and Training Times for Petroleum Production in District 2, prepared by the manpower subcommittee of the District 2 Production Committee.

Regional boards will be instructed by the National War Labor Board to approve applications for authority to raise wages to the minima indicated above. Any individual contractor who desires to raise wages to the minima given above should write to the appropriate regional office of the War Labor Board and ask for copies of WLB Form 10. After the form has been received, it should be filled out requesting permission to raise rates to the level of those given above. Approval of such applications will be almost automatic but may take some time, due to the backlog of cases now on hand. Of course, the question of raising present rates to the indicated minima is an entirely voluntary one in so far as individual contractors are concerned. Anyone now paying less than the minima need not increase his rates unless he wishes.

Contractors already paying wages equal to or higher than the minima which have been established cannot receive approval for wage increases except under very special circumstances. Since wages have now been stabilized on an equal basis throughout the Mid-Continent area, it appears that the first point in our program has been taken care of, and that attention should now be given to the two remaining ones.

Steady Employment Essential

In order to persuade men to return from shipyards and other war industries which afford steady employment at high wages, it is obvious that assurance of steady employment in drilling operations must be given. Continuation of the intermittent employment characteristic of the industry in the past will be a great detriment to successful recruitment efforts. In addition, it is most unlikely that the War Manpower Commission will cooperate in any plan designed to recruit workers for an activity in which they were not to be employed full time. In order to assure continuous employment of drilling crews, it has been our understanding that the association will develop a program for its members which will permit sufficient advance notice of interruptions in operations to allow shifting of crews to other areas where they may be needed.

The PAW has agreed to furnish the association with current estimates as to the number of active drilling operations by districts, together with statements of future requirements. These figures are now in process of preparation by the Production Division, and will enable you to make an accurate forecast of your future labor needs.

The third part of the program involves the return of men who have left the industry for employment in shipyards and aircraft plants. The

*Associate labor counselor, PAW.

PAW has discussed this problem with regional directors of the WMC and it is recognized that it will be impossible to meet present drilling schedules without such action. Of course, the individual contractors are the only ones who have any information as to the names and present whereabouts of persons formerly in their employ. I believe you have been asked by the association to furnish it with names of all of your former employes who are not now in the armed services who have had at least 3 years' experience in drilling operations, if their present address is known. The association will then forward names of these individuals to the WMC which will attempt to contact the men and obtain their release for return to the drilling industry.

Association to Assign Men

Men will not be returned to the industry except in numbers equal to job orders on hand at the association headquarters. When individual men are returned, the association will assign them to work with the bargaining agent who has made the arrangements to procure him a job. Men who have returned to the industry under such an arrangement will have to undertake to notify the association should they become unemployed so that they may be assigned to other drilling operations. Of course, if the association is unable to place him in the industry, he will then be referred to the WMC for placement in other industries.

The program outlined above appears to be a practical one which will work if all the parties to it cooperate fully. The War Manpower Commission realizes the seriousness of the situation and has been most helpful. It must be understood clearly, however, that labor supply is so short at the present time that no underutilization can be allowed. Consequently, it is imperative that the program be followed completely so that a satisfactory state of labor utilization within the industry will prevail.

With respect to Selective Service problems, the situation has been somewhat eased by the issuance on August 16 of the list of 149 critical occupations. Persons employed in these occupations will be given maximum consideration for occupational deferment, and it is not anticipated that any more individuals from this group will be drafted. Rotary drillers are shown in this list of occupations and if you should have any problem with respect to drafting of these employes, it should be clearly pointed out to the local board or the state director that the person in question is engaged in a critical occupation and as such is entitled to deferment.

None of the other occupations peculiar to oil-well drilling operations are included in the list. However, replacement schedules can be used to effect an orderly withdrawal of employes and should be used by all employers who have more than 15 or 20 draft eligibles.

Vickers Celebrates Twenty-Fifth Anniversary

WICHITA, Kans.—The twenty-fifth corporate anniversary of Vickers Petroleum Co. was marked last week by distribution of a brochure in which milestones of the company's growth and progress are graphically illustrated.

The book lists as Vickers' "firsts": 1923, bubble towers, first in the Mid-Continent; 1926, high-compression antiknock gasoline; 1927, flashing in the cracking cycle; 1937, purification process.

C. L. Henderson, president of Vickers is also president of the Western Petroleum Refiners Association, a member of the Petroleum Industry War Council and holds important posts in the petroleum industry committee organization.

New Process Announced for Isomerizing Pentane

CHICAGO, Ill.—A successful process for the isomerization of normal pentane to isopentane has been announced by Universal Oil Products Co. It is characterized in the announcement as "simple, continuous in operation and easily controlled." Recycle rates are said to be low, with high isomer yields without the use of hydrogen, the employment of which increases markedly the cost of any operation. The catalyst employed is not announced but its consumption in the process is reported to be low.

More than one method is known for isomerizing normal paraffins of low octane number to isoparaffins higher in octane rating and reactive as charge stocks for the alkylation process. In the latter process, the isoparaffin is brought into addition reaction with an olefin of the same or a different number of carbon atoms per molecule, producing alkylate such as isooctane as an aviation-fuel component. Isopentane may be used for either purpose, but is most useful now as a volatility-imparting ingredient for aviation superfuels. The octane number (A.S.T.M.) of isopentane (2-methylbutane) is about 92 by the research method, reportedly slightly higher by the 3C test method. Neopentane (2, 2-dimethylpropane) a less common pentane isomer, has a blending octane number of 116, according to published values. No data are available to determine how much, if any, neopentane is formed in this U.O.P. isomerization process.

Aluminum chloride is one of the main catalysts for isomerizing hydrocarbons and commercial units are already in operation. Anhydrous HF has been studied as an isomerizing catalyst but conclusive data have not been published. Other catalysts mentioned in the literature are metallic oxides and sulfides, also other metal halides; molybdenum oxide and di- and tri-sulfides as well as dehydrogenation catalysts such as nickel oxide, alumina, although these oxides show less activity than do the metal halides.

Isopentane may also be used as charge stock for alkylation processes, in a manner similar to that for isobutane, but it is not so used to any great extent so far as is known. Isopentane is currently more useful as such, because of its higher volatility than alkylate, being above 20 lb. for isopentane against 4 to 5 lb. for commercial alkylate.

DEATHS

Lt. Comdr. Edmund Billings, for many years vice president of Godfrey L. Cabot, Inc., Boston, Mass., must be presumed dead, according to word from the company. He joined the U. S. Naval Reserve in 1939 and was called to active duty in December 1940, as an officer on the U.S.S. Quincy, where he served until that vessel was sunk while defending the initial landings on Guadalcanal Island.

Pat Wilson, general superintendent, Pipe Line Contractors, Inc., fell dead October 1 while directing company field operations near Wichita, Kans. In the construction of War Emergency Pipelines, Inc., project he was superintendent for one of the contractors before serving as inspector with one of the spreads. He made his home at San Antonio, Tex.

E. L. Moorhead, oil man of Los Angeles, Calif., died in that city last week following a long illness. In 1885 he moved from Pittsburgh, Pa., to Tulsa, and in 1908 was actively engaged in development of early oil fields. He went to Los Angeles in 1917 and was affiliated with Oscar R. Howard, oil producer.

Harry Thomas Johnson, 70, president and general manager of Clampitt Oil Co., and a director of the Independent Oil Producers Association of Bakersfield, died in a Los Angeles, Calif., hospital last week. He had been ill for several months.

John T. McMahon, 69, formerly vice president of East Ohio Gas Co., Cleveland, Ohio, died last week. He had been retired from active duty for some time before his death.

Training Nontechnical Personnel to Replace Service-Enlisted Engineers

by E. H. Short, Jr.

Here is a brief outline of what the engineer who is about to leave for military duty can do to assist in training nontechnical personnel to carry on with routine duties. The author calls the program blueprinting the job, and an example of how blueprints can be made up for specific tasks.

WHILE a shortage of engineers in the oil industry has already been keenly felt, it is predicted by many that the situation will become far more critical in the near future. It is therefore necessary to consider replacing engineers as much as possible by less highly-trained personnel.

Obviously it would be impossible for the engineers now on the job to prepare a treatise of their present work which would enable non-technical men to take over. There are, however, many routine duties performed by engineers which could be performed by nontechnical men if the duties were properly written up. There is yet time for engineering managements to have the engineers now employed make what will be referred to as blueprints, covering special routine engineering duties. Such blueprints must be prepared as to enable the nontechnical men to follow without the possibility of error.

Blueprints can be made to adequately cover a number of engineering duties. These can be drawn up in a small, convenient booklet form in such a manner that any intelligent employe familiar with the particular phase of operation involved, could follow. It is important that this last statement be fully understood. The nontechnical man must be familiar with the type of operation covered by a blueprint.

Preliminary Blueprinting Requisites

Assume that an engineer is contemplating the procedure to be followed in preparing a blueprint of a routine engineering duty. One of the first requisites would be for him to discover, if he does not already know it, that there are many individuals in an organization who have considerable capacity for analytical thought when problems arise. Step No. 2, and still one of mental preparation, would be for the engineer to admit his own free use of tables prepared by manufacturers and handbook publishers.

The last, and a rather important requisite before the physical preparation of an engineering-duty blueprint, is for the engineer to mentally divest himself of his technical background and then imagine what he would want in the way of an understandable set of instructions telling how a certain operation or calculation should be performed.

The duties of an engineer which may be successfully blueprinted will depend to a large degree upon the engineering organization and the proper administration of such an unusual type of engineering endeavor. In large organizations which have maintained specialty engineers for all major phases of operation, each engineer has developed his own ideas concerning the particular field in which he works, and consequently has a standard procedure he follows in carrying out certain operations and solving different problems. Perhaps the best way to suggest the many engineering functions which may be blueprinted is to give an example.

A well has been completed and a superintendent, for example, wants to know what size of equipment to install. Under the present setup in many companies, the field superintendent is a field executive and in normal times would refer such a problem to his engineering staff. While some superintendents instinctively know through experience just what size of equipment should be used under almost any given condition, a blueprint should permit greater uniformity in company operations, and at the same time minimize the possibility of mistakes.

Given conditions:

Total depth of well	7,259 ft.
Producing fluid level	5,125 ft.
Maximum daily production to be produced	350 bbl.
Corrosive condition (high-medium-minimum)	High

It might appear that step No. 1 should be the selection of the proper-sized pump bore. This, however, cannot be figured until the aproximate size of the pumping unit is known, because the pump capacity is dependent upon the pumping cycle. Therefore, step No. 1 involves a **tentative** selection of a pumping unit which will handle 350 bbl. per day from a depth of 5,125 ft. The selection is called tentative because after the weight of the well is calculated it may be found that the well load, although within the limits of the walking-beam capacity, is too great for the gear box. In other words, the twist imparted to the gears and shaft might be greater than they will safely stand. This twist is called peak torque, and each pumping unit is rated for the maximum amount it will stand for an indefinite period of operation.

Step No. 1—Find horsepower of pumping unit required.—In Fig. 1 the pumping depth is shown on the left and across the bottom of the chart is daily production. Project up-

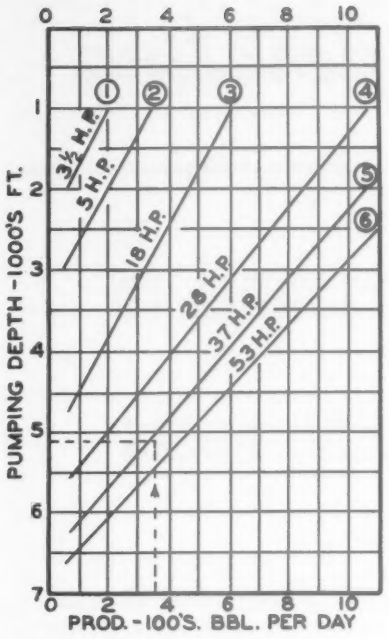


Fig. 1: Pumping units selector charts

ward with a straight edge until the horizontal line representing a depth of 5,125 ft. is met. Select the unit nearest the intersecting point of the two lines. In this example a 37-hp. unit is indicated. Table 1 shows that the unit has a peak torque rating of 184,000 in.-lb.

Step No. 2—Selection of pump size. —In Table 2 find the polished-rod travel if the unit is operated at a maximum cycle. The unit selected tentatively has a maximum stroke of 54 in. Assuming a maximum speed of 30 s.p.m. the polished rod travels 1,620 in. per minute. From Fig. 2 find the smallest-bore pump which can be used to handle 350 bbl. fluid per day,

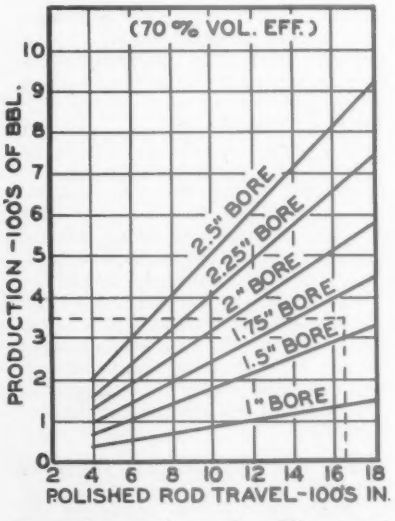


Fig. 2: Pumps selector chart (70 per cent Vol. Eff.)

TABLE 1

Unit No.	Max. stroke (in.)	Max. pol. rod load	Peak torque	Pol. rod travel in in. per minute at max. stroke and 30 s.p.m.
1	22	5,200	17,000	660
2	34	9,500	35,000	1,020
3	36	12,600	89,500	1,080
4	44	15,900	137,000	1,320
5	54	21,400	184,000	1,620
6	54	21,400	268,000	1,620

TABLE 2—A. FIND: WEIGHT IN POUNDS PER FOOT FOR FLUID AND RODS

Pump bore (in.)	Size of rods ¾ (in.)	¾ and ⅞ (in.)	⅞ (in.)	1, ⅞ and ¾ (in.)	1 and ⅞ (in.)
1	1.97	2.11	2.54	2.37	2.73
1¼	2.16	2.32	2.73	2.59	2.93
1½	2.39	2.56	2.96	2.86	3.18
1¾	2.67	2.87	3.24	3.17	3.47
2	2.99	3.21	3.56	3.55	3.80
2¼	3.35	3.60	3.92	3.96	4.18
2½	3.75	4.03	4.32	4.43	4.60

TABLE 3—THE AMOUNT OF WELL LOAD IN POUNDS THAT VARIOUS KINDS OF RODS WILL STAND UNDER DIFFERENT FLUID CONDITIONS

Type of rod	Size (in.)	Fluid Conditions: High sulfide	Medium	Minimum
A	⅝	3,650	9,000	16,500
B	⅝	4,950	6,730	16,000
C	⅝	6,850	10,000	16,000
A	¾	5,300	13,000	25,000
B	¾	7,100	9,650	23,000
C	¾	9,950	14,000	23,000
A	⅞	7,270	17,500	34,000
B	⅞	9,680	13,000	32,000
C	⅞	14,000	20,000	32,000
A	1	9,500	23,000	44,000
B	1	12,500	17,000	41,000
C	1	18,000	25,000	41,000

at 70 per cent efficiency. The selection falls between the 1½-in. and 1¾-in. bore, and in a case of this kind the larger pump should be selected. Projecting downward it will be found that a 1,400-in. polished-rod travel is required for a pump of this bore to handle 350 bbl. per day. Since the maximum length of stroke is to be used the stroke per minute is found by dividing 1,400 by 54, which equals 26 s.p.m.

Step No. 3.—Figure weight of well. —This step must be divided into two parts, A and B.

A. In calculating the weight of the well assume the use of a 3¾-in. rod string. Correction in well weight for the proper-sized string can be made later on. Referring to Table 2 it will be found that the weight per foot of pumping depth for the fluid and rods when a 1¾-in. bore pump is used, amounts to 2.67 lb.

B. In Fig. 3 select polished-rod travel of 1,400 in. per minute and project horizontally to line. At the point of intersection project vertically downward and find 1.26. This is percentage of well weight increase due to the pumping cycle. Therefore, the factor of 1.26 times dead weight of 2.67 lb. gives the pumping weight foot of pumping depth, or 3.36 lb. In this particular example the pumping depth is 5,125 ft., so that this figure times 3.36 lb. gives the total pumping weight of the well, or 17,220 lb.

Step No. 4—Select size of sucker-rod string.—It is extremely important that the proper rods be selected for a given condition, since an inadequate string of rods can be a source of high repair expense. Bearing in mind that the well has a

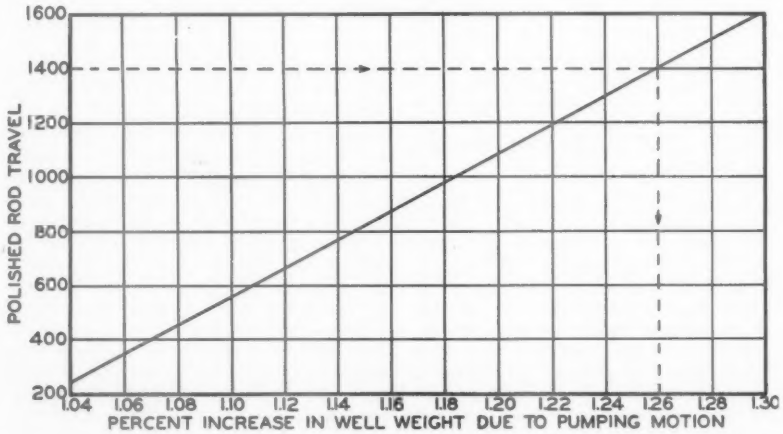
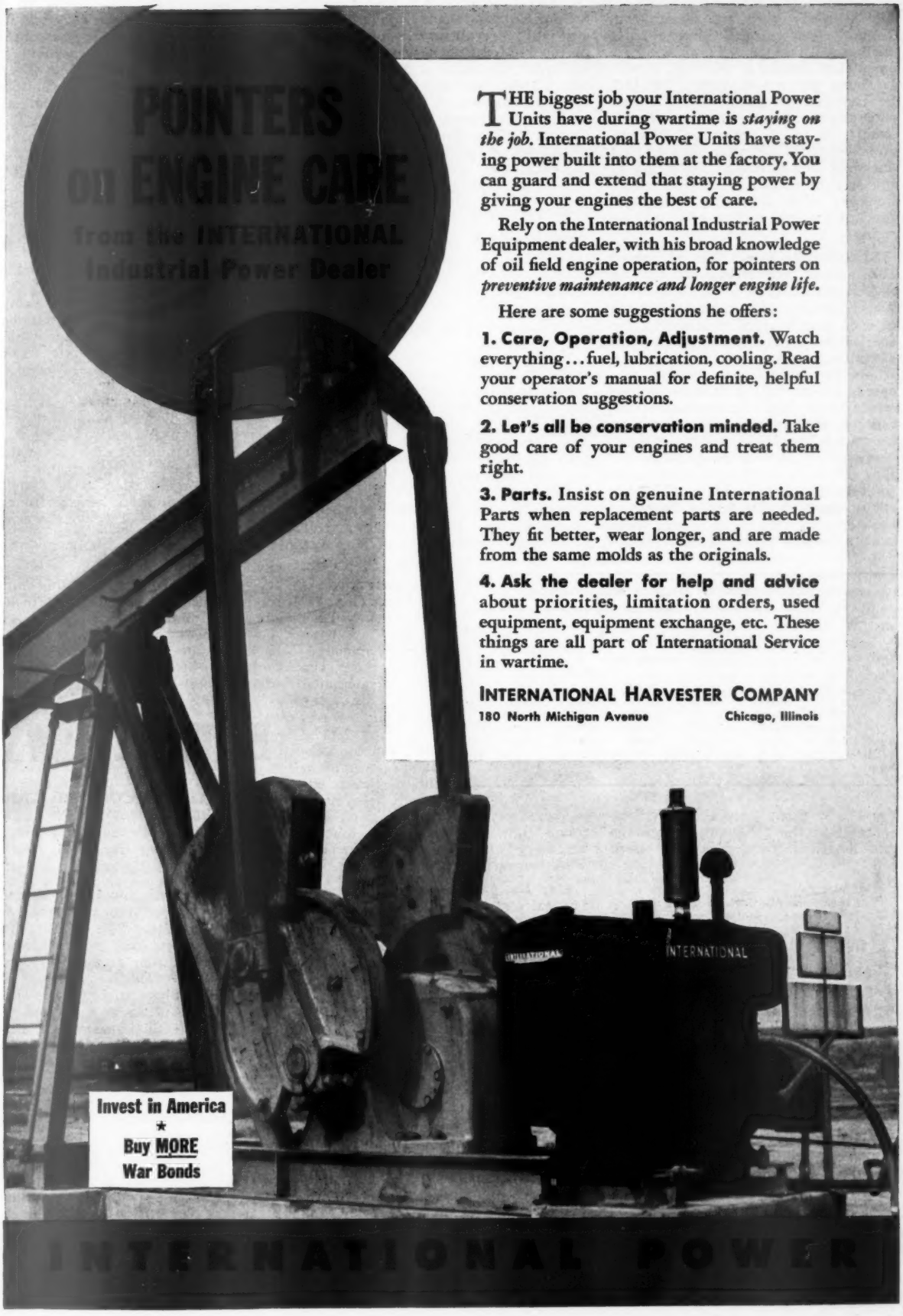


Fig. 3



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1. Care, Operation, Adjustment. Watch everything... fuel, lubrication, cooling. Read your operator's manual for definite, helpful conservation suggestions.

2. Let's all be conservation minded. Take good care of your engines and treat them right.

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4. Ask the dealer for help and advice about priorities, limitation orders, used equipment, equipment exchange, etc. These things are all part of International Service in wartime.

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high sulfide condition, select from Table 3 the size and kind of rods needed to handle the approximate calculated weight of the well. It will be found that a 1-in. type C rod will be required to handle such a well satisfactorily. Tapered strings of rods should be used wherever possible, and the above indication of 1-in. rods does not mean that a full string of this size should be used. It does mean, however, that this size should be used at the top portion of a tapered string.

Step No. 5—Select size of tubing and tapered rod string.—It will be noted that either a 1, ⅞, ¾-in. or a 1 or ⅞-in. combination tapered string of rods may be used. Ordinarily, the size of the pump determines the size of tubing to be used. In this case, where the use of 1-in. rods is indicated, 2½-in. tubing is the smallest size which will accommodate the rods. A three-way combination may be used when 2½-in. tubing is used; however, it should be pointed out that when the pump size calls for 3-in. tubing a 1-in.-⅞-in. combination should be used, due to the danger of corkscrewing the ¾-in. rods when breaks occur. From Table 4 select the 1¾-in. pump bore and it will be found that the following percentage and length of rods should be used:

Size of rods (in.)	Percentage	Calculated footage	Actual footage because of 25' rod length
1	26	1,333	1,350
⅞	29	1,486	1,475
¾	45	2,306	2,300
		5,125	5,125

Step No. 6—Recalculate weight of well based on selected rods.—From Table 2 it will be found that fluid on a 1¾-in. pump and a three-way combination of rods weights 3.17 lb. per ft. of pumping depth. From Figure 2 it will be noted that the dead weight of the well should be increased by 1.26 which allows for the increased weight due to the pumping motion. Multiplying 1.26 times 3.17 lb. times 5,125 ft. the total weight of the well becomes 20,448 lb. This weight is somewhat greater than the recommended load to be imposed on such a string; however, it is sometimes necessary to overload the rods by 25 per cent of the recommended load.

Step No. 7—Calculate peak torque.—It will be recalled that the selection of the pumping unit was considered tentative. The unit originally chosen was a 37-hp. unit and had a polished-rod load capacity of 21,400 lb., and a peak torque rating of 184,000 in.-lb. The A.P.I. formula for calculating peak torque is shown below:

$$\text{Peak Torque} = \frac{\text{Polished rod load times length of stroke}}{4}$$

$$= \frac{20{,}448 \times 54 \text{ in.}}{4}$$

$$= 276{,}048 \text{ in.-lb.}$$

Unless it is absolutely necessary in order to produce a well, the peak torque to be applied to a unit should not exceed the recommended amount, since breakage may result. In this case the peak torque is over 50 per cent greater than recommended for the unit selected. Therefore, the next larger sized unit shown in Fig. 1 should be used. This unit has a 53-hp. gear box, and a peak torque rating of 268,000 in.-lb.

TABLE 4—TAPERED SUCKER ROD STRINGS*

	Combinations				
	1 in.-⅞ in. & ¾ in.			1 in. & ⅞ in.	⅞ in. & ¾ in.
	% needed			% needed	% needed
Pump bore, in.	1 (in.)	⅞ (in.)	¾ (in.)	1 (in.)	⅞ (in.)
1.00	21.40	22.00	56.60	22.7	25.0
1.50	24.85	26.05	49.10	26.2	29.1
1.75	25.95	28.65	45.40	28.4	32.9
2.00	29.35	31.85	38.80	30.9	36.5
2.25	32.05	35.35	32.60	33.8	40.6

*Briefed from S. M. Jones Tables on Combination Sucker Rod Strings.

Step. No. 8—Calculate counterbalancing required.—The weight of the counterbalance required for the beam is calculated by dividing the maximum well weight by 2. The indicated counterbalance weight in this particular example, therefore, is approximately 10,200 lb. It may be found that a change in weight is necessary after the well has been placed in operation and weighed.

Step No. 9—Summarize findings.—The calculations made should be set down as follows and rechecked, starting out with the calculated size of unit.

Size of pumping unit	53 hp.
Bore of pump	1¾ in.
Well weight (trial calculation)	17,220 lb.
Size rods and length each size:	
1-in.	1,350 ft.
⅞-in	1,475 ft.
¾-in.	2,300 ft.
Size of tubing	2½ in.
Well weight (recalculation)	20,448 lb.
Peak torque	276,048
Counterbalance	10,200 lb.

The foregoing charts and explanatory data have been presented in skeleton form, since the methods and types of equipment employed by different companies vary so greatly that blueprints, to be applicable to a particular company, would have to be prepared within the organization itself. Various sizes and types of pumps, sucker rods and pumping units are used, and the charts and instructions for one company might not be standard practice for another.

The purpose of the example given, therefore, is to illustrate that routine engineering duties of this kind can be drawn up in such a manner that nontechnical men should have no difficulty in carrying on some of the routine work of the engineers. The instructions shown could be blueprinted, mimeographed or photostated, with each step covered on one page. These pages could be bound and furnished to the various field offices in a small convenient booklet form.

The selection of pumping equipment is only one of a great number of routine engineering duties which could be written up and given to the nontechnical employes, although in some cases it might be necessary to supplement the blueprints with an explanatory discussion for the employes who use them. The field is wide and the number of duties which may be successfully blueprinted by any one organization will depend upon the imagination, resourcefulness and ingenuity of the engineering management.

This plan does not envisage elimination of the engineer. As stated at the outset, blueprints of this kind might be used as an emergency measure to minimize trouble, delay and inefficiences in operation which should result if a more severe drain on technical manpower is imposed upon the oil industry.

BOOK REVIEWS

PEACE AND RECONSTRUCTION: A CATHOLIC LAYMAN'S APPROACH. By Michael O'Shaugnessy. Published by Harper & Brothers, New York. 151 pp. $2.

Here is a fresh and independently reasoned approach to the problems of peace making. The author considers the ways and means toward social justice in our own country and in the world. During the past 20 years, Mr. O'Shaughnessy was editor and publisher of South American Oil Reports, and O'Shaugnessy's Oil Bulletin.

HANDBOOK OF CONCRETE CONSTRUCTION. Published by Universal Atlas Cement Co., 135 E. 42nd. St., New York City. 274 pp.

This is the eighth edition of this practical handbook. It includes sections on concrete made with standard portland cement, with high early strength portland cement, with special cement for refractory, insulating and corrosion-resistant concrete, and with special cement for oil-well cementing.

Safety Program in Natural-Gasoline Plant Built Around Suggestion System

*by Roy A. Schuster**

Small plants which do not find it feasible to employ a full-time safety director can plan an effective program based on a suggestion system in which everyone takes part. Here is how it is done in one plant.

NATURAL gasoline is one of those products produced in plants usually situated in remote locations. Here, as in most continuous processes, automatic controls are used extensively and the number of men needed per shift is small. Some extra men may be needed, usually on the day shift, for loading and maintenance.

A safety program planned for a plant employing hundreds of men cannot be carried on satisfactorily by small gasoline plants scattered over a state or several states. A full-time plant safety director is not justified, so the responsibility for preventing accidents falls to the superintendent or plant foreman, who must develop and maintain a definite safety program. Our own program has been developed to meet the peculiar needs of the industry.

The program is built around a suggestion system in which everyone takes part. Only two general safety meetings a year are held and the program is kept active between meetings by the suggestion system, by periodic inspection, by passing out safety information personally to each man, and by the use of posters on the bulletin board. And most important, there is a follow-up of all suggestions by the management.

One of the safety meetings is held in the spring and the other in the autumn. The superintendent, plant foreman and all employes not on duty are requested to attend. A dinner helps boost attendance. These meetings have been marked by spirited discussions and almost 100 per cent attendance.

An employe from the plant is appointed safety secretary to record the minutes of the meeting, keep a file of all safety literature passed out, and to maintain a record of suggestions turned in by employes.

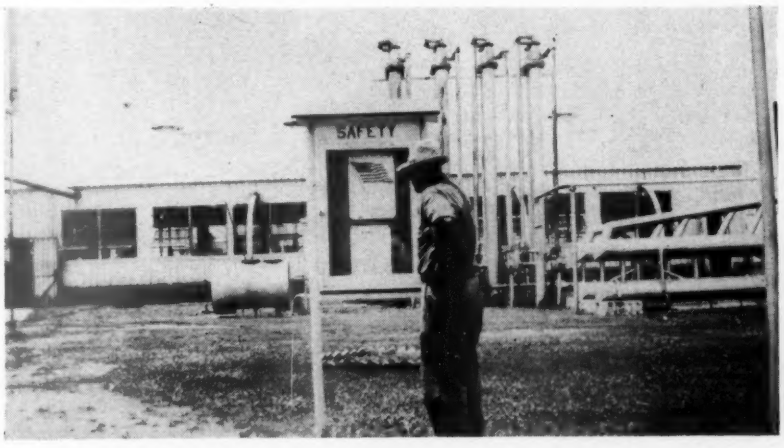
At these semiannual safety meetings, the discussion is concerned principally with suggestions turned in by the men. It is the duty of the secretary to bring several new suggestions to the meeting. Each man is given credit for the suggestions contributed and his name is incorporated in the minutes, along with the details of his idea. This recognition has proven to be a strong incentive.

Most important in the program is a careful follow-up by the supervisors of all suggestions. Nothing will kill interest more quickly than to allow ideas to be laid aside and forgotten. When a suggestion is offered, which is not practical, the foreman must personally contact the man and explain the reason for not using the idea. Some plans might reduce the hazard in one line but create a greater hazard in another. This must be explained carefully. However, an idea that has unquestionable merit should be carried out, even though the immediate expense may be considerable; the cost of one accident may be several times that of the corrective measure.

Even suggestions which seem to be of doubtful value should be discussed and anlyzed, so that even a small item will not be overlooked. The good will and continued interest of the employe is always increased by the adoption of his idea, and that is sometimes worth even more than the suggestion. The suggestion system is in operation throughout the year. The foreman takes care of items that come up, but all ideas are reviewed at the regular meetings and recorded in the minutes.

(Continued on page 58)

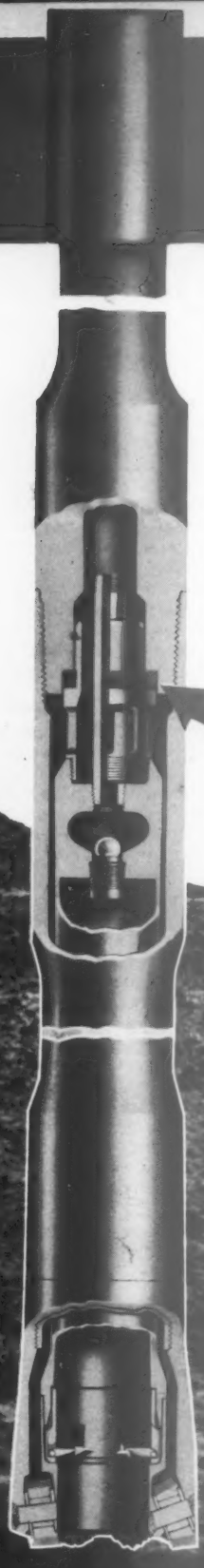
*Superintendent of Gasoline Plants, Preston Oil Co. Article made available for publication through courtesy of National Safety Council and the author.



The plant's safety bulletin board is located where employes pass by when coming to work

All persons entering property must deposit matches and lighters in provided receptacle

The REED Kor-King for CONVENTIONAL CORING



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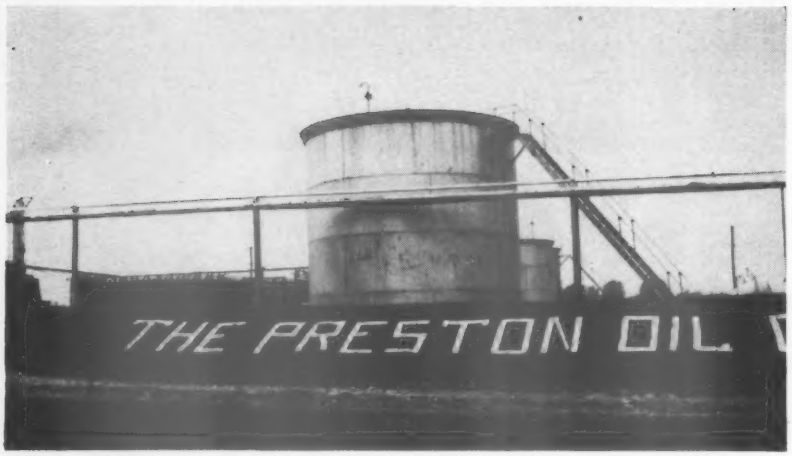


Atmospheric pressure storage tanks for gasoline are equipped with flame arrestors

Sometimes a regular plant bulletin board contains so many posters and notices, some of which are permanent, that safety items may be easily overlooked. A bulletin board, exclusively for safety material, has been installed just inside the main gate where it can be seen easily by men coming to work. Posters are changed frequently, and occasionally the board is left entirely blank. When a poster appears after the board has been left blank for several days, the men are sure to notice it and read it.

Four times a year, safety inspections are made of the entire plant by the secretary and foreman. A special three-page form has been prepared for recording the findings of the inspection. General headings cover boilers, engines and pumps, abrasive wheels, electric installations, elevated platforms, stairs, doors and floors, buildings, tools, fire protection, first aid and miscellaneous. Under each heading are from 3 to 18 questions covering the items to be inspected.

Although most of the questions can be answered by yes or no, space is provided for remarks, and several items on each report will require further explanation. It is the responsibility of the superintendent to follow up any hazard reported and see that it is corrected. In making these inspections, it is often helpful to have foremen inspect some other plant.

Because of the long interval between meetings, considerable safety literature is passed to the men. The National Safety Council, the American Petroleum Institute, and other organizations issue regular publications describing accidents which have occurred and giving helpful information on overcoming a variety of hazards. These are studied carefully and reports of accidents which are likely to occur in the natural gasoline industry are used in the compilation of a safety letter. This letter is mimeographed or hectographed and a copy sent to each employe.

In additional to the occupational accidents, accidents which have occurred in the home, on the farm and highway are also discussed. More accidents occur off the job than on the job, and both result in loss of manpower. Employes are requested to take these safety letters home for their families to read.

These safety letters are passed to every employe through the safety secretary at intervals from three to six weeks. Payroll inserts, handed out with the checks at irregular intervals, also present valuable thoughts on safety. The National Safety Council also publishes a monthly pocket-size magazine called The Safe Worker, which deals with safety subjects in a humorous manner and gets a point across quite effectively. This magazine is distributed for several months and then some other type of safety literature is substituted.

It will be noted that this part of the safety program stresses variety. It is felt that if an employe expects a certain type of bulletin the first of every month, it will become a matter of routine and some of its effectiveness may be lost. However, if he gets something unexpected, he will read it and learn what it is about.

Inspection of all fire-fighting equipment is made three times a year. At these inspections, the carbon tetrachloride type of extinguisher is actually tested. Any found inoperative are either returned to the manufacturer for repairs or are replaced. At the annual recharging periods for the soda-acid and foam type extinguishers, they are actually discharged to determine whether they function properly. At the other two inspection periods, these extinguishers are simply inspected to see that they are full and in proper locations.

A small booklet containing general safety rules has been compiled and a copy given to each employe. These booklets are distributed to all old as well as new men. The employes are then questioned by the foreman 10 to 15 days after they receive the books to make sure that the books had been read. The men are warned that they will be examined on the contents of these books.

These booklets contain about 50 safety rules compiled from various sources. About 40 of the rules are more or less general, but emphasis is placed on the manufacture and handling of gasoline. The remaining 10 rules are based upon analysis of accidents which have actually occurred in the plant.

Of all the details of the program the most important is an unfailing follow-up of all suggestions.

Left: Emergency switch for shutting down the recompressor is painted red and is located at a safe distance from the compressor building. Right: Plant foreman and employe making quarterly inspection of the fire-fighting equipment

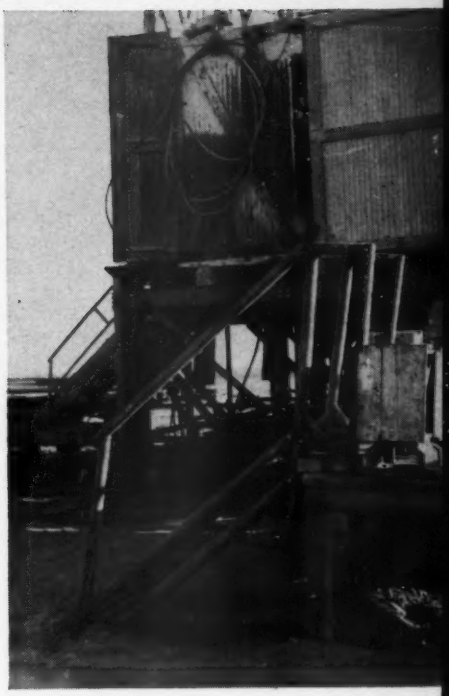
OPERATING IDEAS

Water-Skimming Jet

REMOVAL of water accumulating on top of the mud in pits used with a rotary-drilling rig presents a minor problem. If a pump is available the suction can be raised and the water taken off by this means. However, in many instances a pump is not available without shutting down the rig and in addition some of the mud is generally picked up and pumped away. The small skimming trap shown in the photo can be used to advantage for this purpose. It consists of a piece of 12-in. casing with the lower end closed, which can be raised and lowered to suit the fluid level. A collar welded in the side halfway down serves as an outlet for a jet, the steam line for which enters at the top. Water flows over the top of the 12-in. and is picked up by the jet and removed. A small chain hoist controls the position of the 12-in. pipe.

Ladder on Vent Line

MOST operators are equipping tank batteries with vaporproof systems in order to reduce gravity losses by evaporation. The vent valve, an integral part of such systems must be checked to see that it is operating properly. These vents are always located as far as practical above the ground level so that the gas coming from them will be dissipated by the atmosphere. To provide access to the vent valve, one operator welds small steps on the riser. These are made of old sucker rod. Gage glasses on the side of the chamber permit checking of the fluid level from the ground.



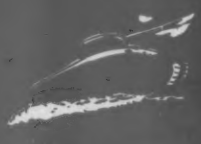
Steps for Derrick Platform

CONSTRUCTION of wooden steps at walkway ends and entrances to the drilling derrick floor at each location is both costly in material and labor. One drilling contractor has fashioned steps from old 2-in. tubular material with expanded metal treads. The upper end has an overhang so it can rest on the floor or platform. A leg projecting downward from the upper end can be supported by blocking of the proper height. Note that instead of running the ramp down to the ground, it terminates in a platform approximately as high as a truck bed.

Pumping Engine Flywheel Drives Generator to Charge Batteries

AN ordinary six-volt generator salvaged from a discarded automobile and driven off the rim of a pumping engine flywheel serves as an improvised charger for automobile and other ignition batteries used by one California lease operator. A hinged clamp holds the generator in position so that a friction pulley on the driving end makes contact with the rim of the pumping engine flywheel. To maintain running contact, a helical spring is attached to the engine base and the generator bracket. This may be disconnected so the generator will drop away from the flywheel when the battery is fully charged.

America's greatest



THE LINCOLN ELECTRIC COMPANY • CLEVELAND, OHIO

BACTERIAL CORROSION

Of Water-Cooling Pipes

*by Dr. C. L. Clark**

This article describes various tests that were employed to obtain direct evidence of the presence in the water and in the corrosion products of bacteria with ability to reduce sulfates to sulfide and free sulfur. These bacteria were definitely identified. They are anaerobic and thus cannot live in presence of oxygen.

CONSIDERABLE attention has long been given to the general subject of corrosion of ferrous materials but the annual losses due to this cause still are enormous. Because of the present-day scarcity of steel the prevention of corrosion is of even greater importance, for every pound of metal conserved is a pound of melting capacity saved.

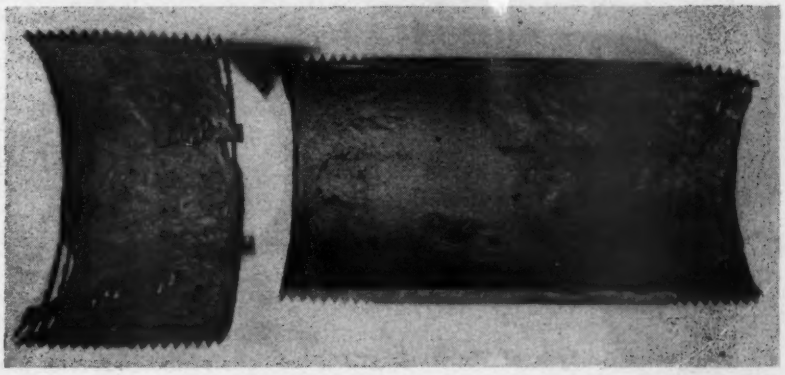
Great strides have been made in combating various types of corrosion. For example, in the presence of hot petroleum products, the resistance of steels to attack is known to be largely a function of the chromium content. Likewise, severe attack which may result from galvanic action is generally well recognized. Also many new analyses have been developed during recent years for combating corrosion by definite reagents in the chemical and allied industries.

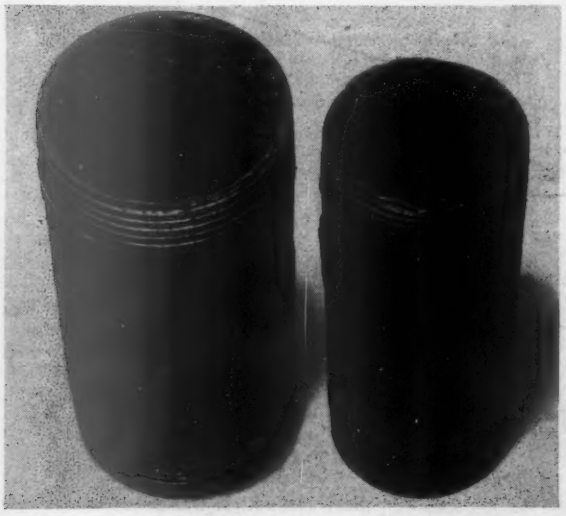
In spite of all the work which has been done in this field certain cases of corrosive attack still arise which are very puzzling and unexplainable unless one is familiar with all the various aspects of corrosion in general. Such a case recently arose in connection with the water-cooling pipe lines of our steel mill.

For the past 3 years corrosion, in varying degrees, has been occurring in the water-cooling lines of the steel mill of the Timken Roller Bearing Co. At first this corrosion was rather slight, but recently it has become much more severe, certain of the lines having a life of only a few months. The pipe lines throughout the mill are not buried and the attack occurred on the inner wall.

The cause of this corrosion was traced to sulfate-reducing bacteria. This form of attack is not new, having been known for over 100 years, but it is not believed to be generally recognized. It is, therefore, entirely probable that corrosion of this type has been confused with other forms. Since a proper analysis of the cause of attack will greatly hasten its elimination it was believed advisable to describe the particular conditions encountered.

*Research metallurgical engineer, Steel and Tube Division, Timken Roller Bearing Co., Canton, Ohio.





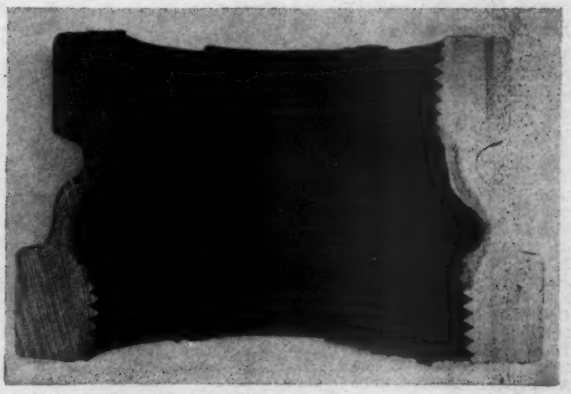
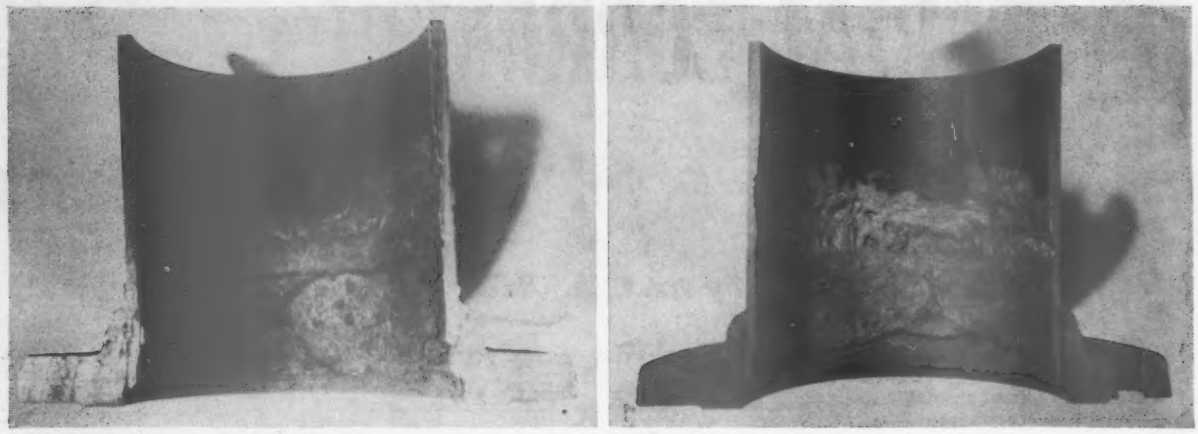


Fig. 1 (left)—Photograph showing two different types of attack on inner wall of water pipe. Fig. 2 (above)—Etched sliced sections showing severity of attack. Fig. 3 (below)—Macro-section of fitting. Attacked portion etched darker



(a) Unetched *(b) Macro-etched*

Fig. 4—Corrosion of pipe section welded to flange

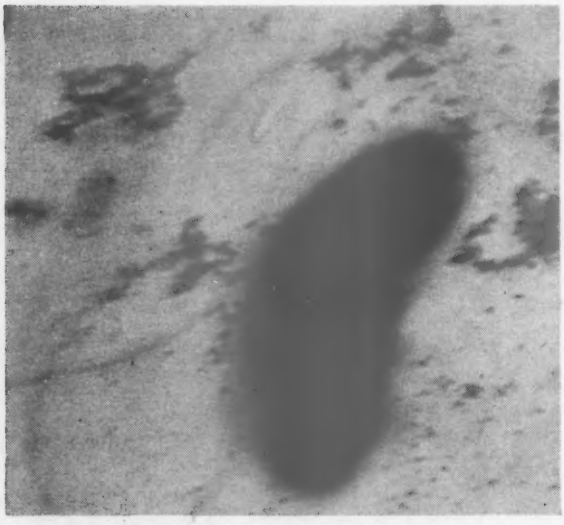


Fig. 5—Sulfate-reducing bacteria from corrosion products, greatly magnified

Source and Analysis of Water

The water used for cooling purposes is obtained from a well which is approximately 150 ft. deep by 12 ft. in diameter. At the base of the well 36 pipes, 8 in. in diameter, extend radially outwards for feeding. Five pumps draw the water from a zone 8 ft. from the bottom of the well. The capacity is 30 million gallons per day. The temperature of the water as it leaves the well is 52° F. and the pH varies from 6.7 to 7.8. The analysis of water samples taken at the well, and after it has served for cooling the No. 8 electric melting furnace and the reheating furnace for the 10-in. mill, is given in Table 1.

The analyses at these three points are nearly identical, and yet little if any corrosion has occurred at the 10-in. mill reheating furnace, while it has been severe at the No. 8 furnace and in the enclosed metal parts of well. On the basis of these analyses this water would not appear to be corrosive, at least to the extent encountered. The problem was further complicated by the fact that the city water of Canton was of approximately the same analysis and yet no marked corrosion occurred in any of the city water lines.

TABLE 1
ANALYSIS OF WATER SAMPLES FROM DESIGNATED POINTS IN THE MILL

	Well (p.p.m.)	At No. 8 furnace (p.p.m.)	At furnace of 10-in. mill (p.p.m.)
Odor	None	Slight	None
Color	None	None	None
Turbidity	Clear	Clear	Clear
Cl (chloride)	24.7	24.7	24.7
SO_3	146.0	143.0	144.0
SiO_2	12.0	12.0	12.5
R_2O_3	4.0	4.0	4.5
CaO	197.0	199.0	195.0
MgO	50.9	50.2	50.9
Total residue	615.0	625.0	640.0
Ignition loss	75.0	70.0	130.0
Alkalinity ($CaCO_3$)	292.0	292.0	292.0

Corrosion Characteristics

Representative examples of corroded pipe sections are shown in Figs. 1 to 4. The corrosion may be classified as of two types. In one the attack is general, the entire pipe wall being reduced in section; while in the other, attack is selective, leaving small islands of the original metal remaining. These two conditions are illustrated in Fig. 1.

Fig. 2 shows sliced sections of pipes in which, at the threaded ends, the walls are completely corroded through. The wall thickness throughout the entire section has, however, been considerably reduced. A sliced section of one of the fittings removed from the line is shown in Fig. 3. The inner portion of the wall is seen to be of a darker color than the remainder. This darker material is relatively soft and can be readily cut with a pocket knife. The severity of attack in a pipe section adjacent to a welded flange is shown in Fig. 4. In general, the corrosion appears to be worse in those sections where turbulence was liable to occur.

The dried corrosion products were removed from pipe sections and fittings and subjected to chemical analyses with the following results:

Specimen No.	Cl	SO_3	R_2O_3	S, free or as sulfide	SiO_2	CaO	MgO	Ignition loss
A	Nil	Nil	48.60	23.90	6.60	Nil	Nil	19.51
B	Nil	Nil	51.30	11.62	0.70	15.0	0.05	21.33
C	Nil	Nil	52.40	3.71	19.04	Nil	Nil	24.85

A—Outer layer of corroded products from pipes of Fig. 1
B—Inner layer of corroded products from pipes of Fig. 1
C—Dark deposit removed from inner surface of fitting of Fig. 3

The outstanding fact in these analyses is the presence of large amounts of sulfur, either as sulfides or free sulfur, even though the well water showed sulfur to be present only as sulfates. Since there are no chemical reactions by which sulfates can be reduced, the question thus arose as to whether or not the so-called "sulfur bug" might not be present and the cause of the major portion of attack.

With these facts in mind a complete inspection was made of the wa-

ter system throughout the steel mill and the following evidence obtained to substantiate the belief that corrosion was due to sulfate-reducing bacteria:

1. The presence of free sulfur and sulfides in the corroded products but not in the water itself.

2. The odor of hydrogen sulfide in the exhaust cooling water of each of the electric and open hearth furnaces and in the pumping equipment at the well when dismantled.

3. The formation of H_2S when HCl is added to the corrosion products.

4. The fact that corrosion started at the water entrance of the plant, is gradually spreading throughout the entire mill, and is steadily getting worse, even with the same source of water.

While the above findings were strong evidence that sulfate-reducing bacteria were active, it was believed advisable to determine definitely the actual presence of these bacteria and to reproduce this type of attack in the laboratory.

Bacteriological Examination

Various tests were employed to obtain direct evidence of the presence in the water and in the corrosion products of bacteria with ability to reduce sulfates to sulfide and free sulfur. The results of these studies were given in detail in a paper presented last October.* These bacteria were definitely identified and a photograph of one taken with an electronic microscope, at 50,000 magnifications, is shown in Fig. 5. These bacteria are very active, especially when a small amount of inorganic matter is present and, if kept in a small closed container, the products of reaction will kill this organism in 20 to 30 days.

These bacteria are anaerobic and thus cannot live in the presence of oxygen. For this reason they are more apt to be present in water from deep wells or from stagnant ponds. Cultures were made under anaerobic conditions and the bacteria developed to such an extent that steel nails immersed in the solution were badly corroded after only 24 hours.

Conclusions

On the basis of these findings it is believed that sulfate-reducing bacteria are the primary cause of the severe corrosion encountered in the water-cooling pipe lines and the enclosed metal parts of the well. Since these bacteria are anaerobic and hence very susceptible to increased oxidation potential, chlorination of the water should be an ideal treatment for eliminating this attack.

*"Corrosion of Water Pipes in a Steel Mill," 1942 annual convention of American Society for Metals, Reprint No. 26.

Road Magnet Collects Tramp Steel on Refinery Roads

A MAGNETIC pulley, already equipped with slip rings and brushes for conducting magnetizing current to its coils, was fitted with wheels, and used to collect loose steel and iron on the roads of a refinery. The pulley was formerly used to remove tramp iron from petroleum coke. The wheels were made by welding rims, flangewise, around the periphery of a steel disk and bracing with triangular, welded-in brace irons. In the disk centers bearings were fitted in short pipe sections and the pulley so mounted. A spare generator was mounted on the side frame of a tractor, and connected for power by V-belt and pulleys to the auxiliary power outlet from the tractor's gear box, leads from generator being connected to the pulley's takeoff brushes. The pulley is attached to a 4-in. pipe, fastened to the front end of the tractor frame and extending sidewise, by steel angles as shown in the photograph. A carrier belt passes over the pulley and forward to an idler pulley, immediately in front of which is a steel box or bin, mounted between the frame bars, to receive the metal picked up by the pulley.

Since this assembly has been used to drive around plant, punctures to tires have been reduced considerably.

PROGRESS IN METALS

by W. L. Nelson

12 Per Cent Chromium Steel With 1 Per Cent Molybdenum

The use of 1 per cent of molybdenum steels is found to improve such steels with respect to high-temperature corrosion resistance, particularly if silicon is used in the amount of 1 per cent. Long-time creep strength tests have not yet been completed. The study of 12 per cent chromium steels is being conducted jointly by the Allegheny Ludlum Steel Corp. of Brackenridge, Pa., and the Babcock & Wilcox Tube Co. of Beaver Falls, Pa., and is reported in detail on pages 55-62 of the July 1943 issue of Metals and Alloys.

Steels (12 per cent chromium) containing about 0, 0.5, 1, 1.5 and 2 per cent molybdenum were studied, as well as various combinations of 12 per cent chromium steel with small amounts of silicon, tungsten, and aluminum. The general physical properties of the steels ranging from 0.5 to 2 per cent of molybdenum are not greatly different from the properties of plain 12 per cent chromium steel. The usefulness of the 1 per cent molybdenum steel appears to depend upon the fact that the small increase in physical properties justifies the extra cost, whereas the use of 2 per cent molybdenum does not appear to justify the extra cost.

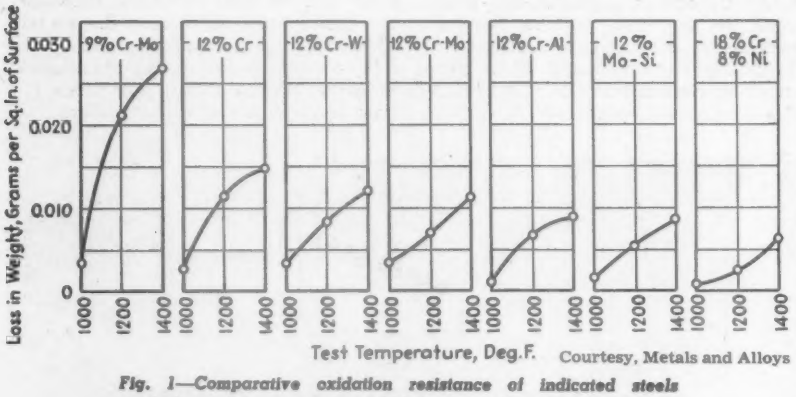


Fig. 1—Comparative oxidation resistance of indicated steels at designated temperatures. 1,000 hours continuous heating tests

The superior oxidation resistance of the 12 per cent chromium steels, particularly with tungsten, aluminum, or molybdenum-silicon, is a primary advantage. According to the results of this research (see Figs. 1 and 2 on this page) these steels are almost equal to 18-8 chromium nickel steel in resisting high-temperature oxidation. The composition of the oxidation resistance specimens are about as follows:

	C	Cr	Mo	W	Al	Si	Ni	Mn
9 Cr-Mo	0.128	9.66	1.09			0.35		0.42
12 Cr	0.068	12.74				0.21		0.32
12 Cr-W	0.128	13.48		3.45		0.26		0.54
12 Cr-Mo		12.00	1.00			0.34		
12 Cr-Al	0.078	13.22			0.26	0.34		0.26
12 Cr-Mo-Si		12.00	1.00			1.10		
18 and 8	0.07	18.16				0.38	8.7	0.31

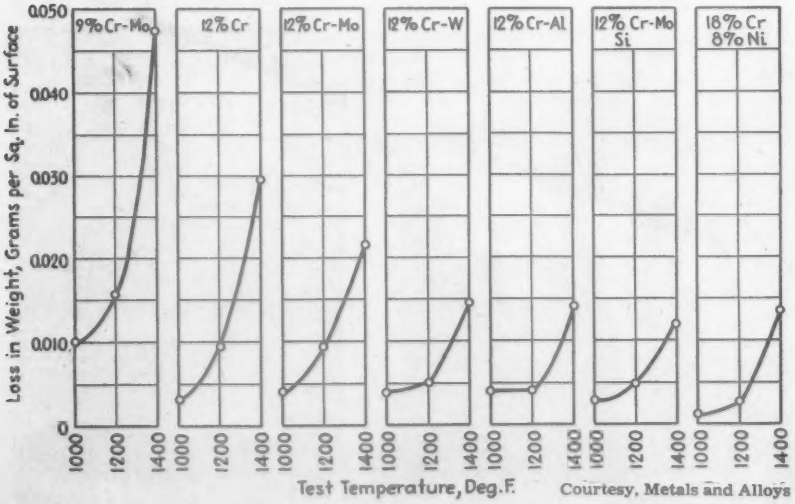


Fig. 2—Comparative oxidation resistance of indicated steels of designated temperatures. Intermittent heating tests

Monel and Nickel Cast-Iron Pump Has Long Life

A direct comparison of a centrifugal pump constructed of cast iron (bronze sleeves and impeller) and one constructed of nickel cast iron (monel sleeves and impeller) is reported in the summer issue of Inco, Vol. 18, No. 4 of the International Nickel Co.

Five years ago last August, a large chemical plant on the Atlantic Coast decided to make a test to determine how nickel alloys actually measure up in direct comparison with other materials against sea water.

They bought two centrifugal pumps from the DeLaval Steam Turbine Co. of Trenton, N. J. Both pumps were exactly the same design as shown above. Both were rated for the same speed (1,765 r.p.m.), same pressure (90 lb. per sq. in.) and the same capacity (1,000 g.p.m.). Both were con-

(Continued on page 74)

Cracking Technology—No. 5

Commercial-Unit Yields Confirm Pilot-Plant Data

*by C. B. Wagner**

Prediction of large-scale cracking results from experimental pilot-plant operations is practicable with our present knowledge of cracking relations. In a multiple coil cracking operation the heavy gas-oil coils produce small yields of rather poor gasoline. Their chief function is to make light gas oil to crack in the light-oil coil, as recycle.

IN the experiments described below the same stocks charged to the coils of a commercial unit processing Illinois crude petroleum were cracked in a laboratory-sized once-through cracking coil. (See Fig. 1.) Five runs were made on each stock, varying the crack per pass in an endeavor to duplicate the operation of the large unit. In Tables 1 and 2 are given significant data concerning these experimental runs and in Table 3 is found a comparison of the experimental results on light gas oil with those secured in plant operation.

The comparison of experimental results with commercial operation is surprising, considering the many variables involved. It shows that it is possible to predict quite accurately the behavior of large units by

*Consultant in refining technology.

TABLE 1

Tests on charging stock—	Reformer charge	Light gas oil	Heavy gas oil	Vis-breaker charge
A.P.I. gravity	35.6	27.0	23.2	19.0
Viscosity at 100° F. S.S.U.	32.7	32.7	41.8	362
N.P.A. color	+2	2+	+5 Dil.	Black
Aniline point, °F.	126	75	103	156
Sulfur, per cent	0.18	0.20	0.43	0.34
Ramsbottom coke, per cent	0.108	0.105	0.44	3.58
Distillation, °F.:				
Initial boiling point	190	186	203	520
5 per cent recovered	340	362	432	580
10	376	408	475	608
20	408	434	507	648
30	430	451	533	675
40	450	464	554	690
50	470	475	570	705
60	490	488	609	714
70	511	502	640	720
80	536	522	672	724
90	578	552	692	...
95	616	583	...	...
End point	662	620	...	...
Per cent recovered	98.5	99.0	93.1	79.0
Per cent residue	1.5	1.0	6.9	21.0
Per cent gasoline (400° F.)	28.9	16.1	8.2	0.0

TABLE 2

	Reformer charge					Light gas-oil charge				
Run No.—	1	2	3	4	5	1	2	3	4	5
Soaker outlet temperature, °F.	970	955	985	1000	970	973	988	1003	1018	988
Pressure, lb. per sq. in.	601	602	600	602	749	603	600	600	600	600
Charge, gal. per hour	2.48	2.51	2.51	2.48	2.51	3.06	3.00	2.98	3.01	2.95
Total gasoline,* per cent	41.3	39.5	42.5	44.7	42.9	25.4	28.3	29.5	32.9	27.1
Octane No. A.S.T.M.	58.9	56.3	61.7	64.6	60.2	66.4	67.8	69.0	69.9	66.6
Octane No. research	64.1	61.3	68.2	70.6	65.2	74.3	76.3	78.2	78.8	76.4
Reid vapor pressure	3.0	3.2	3.2	3.8	3.1	4.1	3.8	4.0	5.2	3.4
Net gasoline* made, per cent	12.4	10.6	13.6	15.8	14.0	9.3	12.2	13.4	16.8	11.6
Recycle produced, per cent	48.5	52.6	44.9	39.9	45.1	66.3	62.0	60.3	57.8	62.2
Aniline point, °F.	96	105	89	76	86	<38	<38	<38	<38	38
700-800 gas oil produced, per cent	...	...	...	...	...	...	...	...	...	...
Fuel oil produced, per cent	2.7	2.3	2.4	2.7	2.3	3.6	3.8	3.1	1.3	5.2
Specific gravity of fuel	1.0201	1.0187	1.0458	0.9938	1.1969	1.0607	1.0615	1.0647	...	1.0381
Gas produced, per cent	7.5	5.6	10.2	12.7	9.7	4.7	5.9	6.1	8.0	5.5
Cu. ft. gas per bbl. net gasoline*	1948	1714	2328	2300	2100	1600	1619	1780	1688	1852
C_4 fraction, per cent	2.7	2.1	3.9	4.1	3.4	2.4	3.5	3.9	4.3	3.8

	Heavy gas-oil charge					Vis-breaker charge				
Run No.—	1	2	3	4	5	1	2	3	4	5
Soaker outlet temperature, °F.	932	917	947	962	933	910	895	880	903	910
Pressure, lb. per sq. in.	400	400	400	400	400	220	220	220	220	220
Charge, gal. per hour	4.35	4.29	4.21	4.15	4.27	7.52	7.22	7.21	7.28	7.00
Total gasoline,* per cent	16.3	15.2	17.9	20.0	16.9	6.1	5.7	4.3	6.8	8.4
Octane No. A.S.T.M.	60.0	60.4	60.6	60.0	60.8	58.1	58.3	58.0	57.9	57.7
Octane No. research	67.1	67.2	68.4	68.1	66.9	63.0	63.2	62.5	62.7	62.3
Reid vapor pressure	3.5	2.8	3.3	3.5	2.8	2.7	2.5	3.1	2.3	2.9
Net gasoline* made, per cent	8.1	7.0	9.7	11.8	8.7	6.1	5.7	4.3	6.8	8.4
Recycle produced, per cent	70.7	72.3	70.0	67.4	69.1	43.5	40.4	39.3	39.6	38.9
Aniline point, °F.	83	83	75	72	79	122	120	121	117	118
700-800 gas oil produced, per cent	...	...	...	...	...	14.8	16.4	16.3	15.9	21.1
Fuel oil produced, per cent	10.5	11.6	9.6	9.6	12.2	35.3	36.8	39.6	37.1	30.9
Specific gravity of fuel	1.0291	1.0114	1.0404	1.0465	1.0128	†12.1	†13.1	†13.6	†12.4	†14.4
Gas produced, per cent	2.5	1.9	2.5	3.0	1.8	0.3	0.7	0.5	0.6	0.7
Cu. ft. gas per bbl. net gasoline*	1036	1068	1160	1176	885	642	759	722	672	636
C_4 fraction, per cent	0.9	0.7	1.0	1.4	0.9	0.4	0.5	0.3	0.5	0.7

*400° F. end point debutanized product. †A.P.I. gravity. Note: Under vis-breaker charge, recycle was 700° F. endpoint.

running charging stocks on small experimental units. The greatest trouble arises in securing a proper mixture of recycle stock and fresh charge, and this can be checked quite well by watching the distillation range and aniline point of the charge to the coils.

The results of these experimental runs have been plotted in Fig. 2. As is to be expected, the light gas oil shows a greater resistance to cracking than the other stocks. This is due to the fact that it contains a larger quantity of recycle stock since it comprises recycle from the reforming coil, from both the heavy portion of the gas oil produced in visbreaking. The chief function of the two heavy-oil coils is to produce gas oil for cracking in the light-oil coil, since they produce little gasoline, and poor quality gasoline at that. The reformer coil in this instance was being charged with a mixture of straightrun naphtha and light gas oil from crude, with practically no recycle in it.

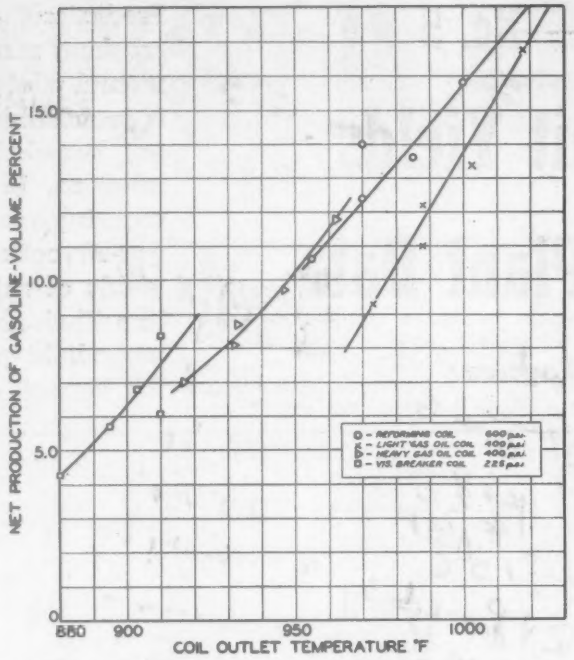


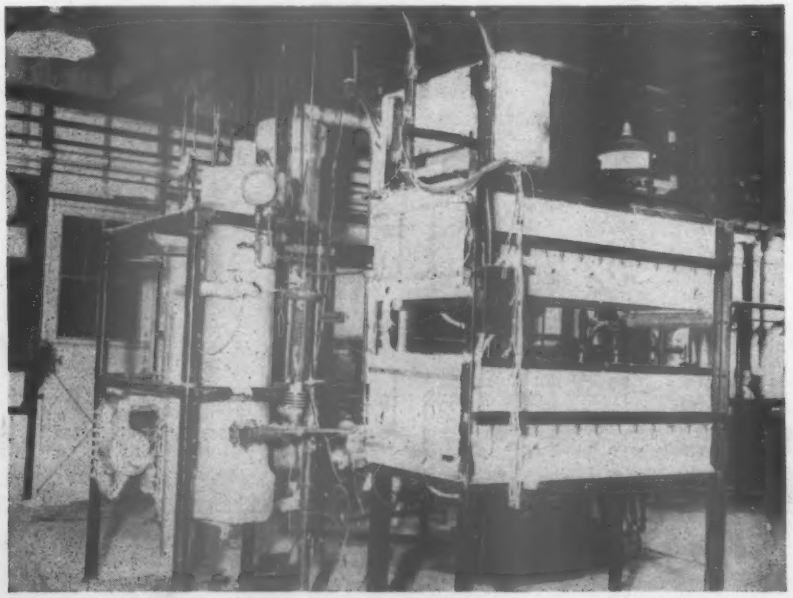
Fig. 2—Results of runs on experimental coil cracker

TABLE 3

	Light oil charge — Experimental coil No. 2	Light oil charge — Experimental coil No. 5	Light oil charge — Commercial unit
Soaker coil outlet temp., °F.	988	988	988
Outlet pressure, lb. per sq. in.	600	600	600
Charge rate, bbl. per hour per cu. ft. soaker coil vol.	2.80	2.80	3.12
Yields, volume per cent of charge:			
400 e.p. debutanized gasoline	28.3	27.1	28.5
A.S.T.M. octane number	67.8	66.6	66.8
Research octane number	76.3	76.4	74.9
Reid vapor pressure	3.8	3.4	3.2
Recycle plus fuel oil	65.8	67.4	65.6
Gas	5.9	5.5	5.9

Editor's Note: This series of discussions began in the issue of September 2, and installments have appeared in all succeeding issues with the exception of September 23.

Fig. 1—Front end of cracking unit showing preheater, cracking furnace, soaking coil on the right hand, flash tower on the left. (Courtesy of Pure Oil Co.)



Progress in Metals

(Continued from page 70)

nected in parallel and used for the same purpose to supply sea water for condenser cooling. Both were operated simultaneously 12 hours a day.

The only difference was in the materials used in the construction of the two pumps. One has a plain cast-iron casing, bronze sleeves and a bronze impeller. The other has a nickel cast-iron (1.68 per cent nickel) casing, monel sleeves and monel impeller.

Sixteen months later the unalloyed iron pump failed when corrosion perforated the casing. It was replaced by another identical pump. Seventeen months later this pump failed, and another one was installed. Each time, the life of the plain cast-iron pumps averaged between 16 and 17 months, and each time the original bronze impeller was reinstalled in the next pump. After 3 years' service, the bronze impeller blades were razor thin. At the end of 4 years, they twisted off the hub.

The nickel alloy pump is still giving perfect service. The only maintenance it has required was after 4 years' operation when the monel packing sleeves were built up with 130X monel welding electrodes and put back in service. The plant superintendent of maintenance reports: "The life of both the monel rotor and nickel cast-iron casing appears to be indefinite."

New Salvage Manual

The Industrial Salvage Branch of the Salvage Division, War Production Board, is distributing its new 300-page "Salvage Manual for Industry." The book contains 25 chapters, embracing all practical phases of industrial salvage activity from the organization of a plant salvage department to methods of segregating, processing, reclaiming and identifying various types of scrap. Both metals and nonmetals are covered.

The book prepared by a staff of salvage experts from industry and industrial-magazine editors, will be distributed without charge to thousands of plant salvage managers.

Metallurgical Terms

Differential Heating

Differential heating is heating in such a way that various portions of an article reach different temperatures in order that different properties will be produced upon cooling.

The processes of flame hardening and induction hardening are based upon the principle of differential heating—the surface being heated to a temperature which permits hardening by quenching, and the interior never attains such a temperature.

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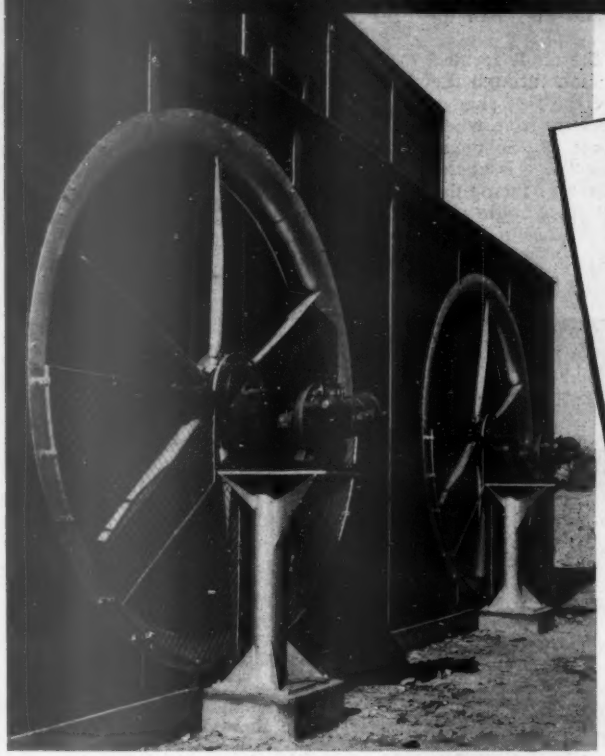
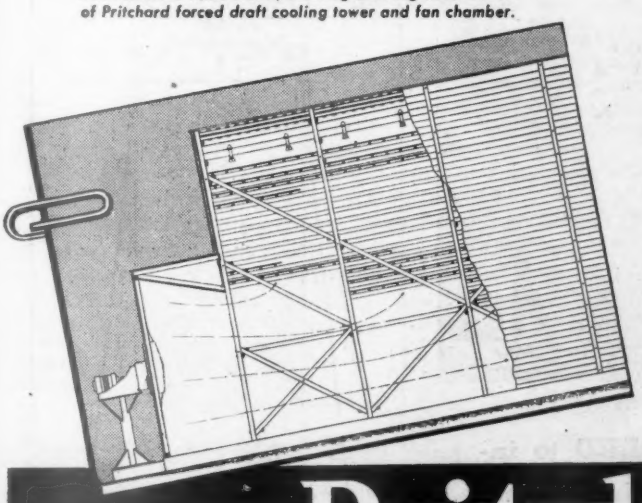


View of fan chamber housing two Pritchard light weight non-corrosive fans. Below, drawing showing construction of Pritchard forced draft cooling tower and fan chamber.



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Fleet Angle Affects Wire-Rope Service

EXCESSIVE fleet angle is often the unsuspected cause of poor spooling on the drum and short wire-line life. This applies to all types of wire line which are spooled on a drum and operated over sheaves, including drilling lines, sand lines, swabbing lines, etc.

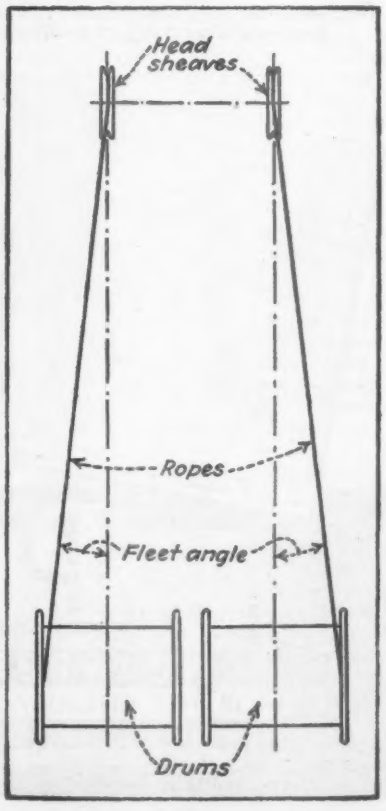
If the fleet angle is too great, excessive wear of the flange of the fast sheave and the rope as it passes over it will result and in addition the rope will be subjected to a heavy grinding, or scrubbing, action as it is spooled and unspooled from the drum. Also, the rope may not spool over the full width of the drum and may ball up and overlap.

The fleet angle is the angle formed between a line projected through the diameter and axle of the fast sheave to the drum and the wire rope when it is adjacent to either of the drum flanges. When the wire rope is at the right of the drum (observer facing the drum) it is the right fleet angle and when the rope is to the left it is the left fleet angle.

Quite frequently the angles are not equal and that accounts for good or acceptable spooling on one side of the drum and poor or damaging spooling on the other half. In some instances, the drum may not be in the middle of the draw-works side of the derrick or the fast sheave may not be in the center of the water table. This latter may be due to the use of a sheave other than the center one for a fast sheave or it may be due to skidding the crown to one side or the other.

The first condition comes from having the crown block skewed instead of being square with the derrick and draw works. The line passing through the diameter and axle of the fast sheave may strike the derrick floor near the corner. The nearest position of the wire rope on the drum would represent an excessive fleet angle which, because the intercept with the drum axis falls outside the flanges, would be all either right or left.

The maximum economic fleet angle for plain-faced drums is 1½° while that for grooved drums is 3°. Generally on drilling derricks, because of their height, the fleet angle is quite small. If the drum and fast sheave are properly alinged, the fleet angle on a 122-ft. derrick would be under 1° and on an 86-ft. derrick it would be approximately 1° 10′. Misalignment could be so bad, however, that the fleet angle would be over 5°, under which condition no drilling could give satisfactory service.



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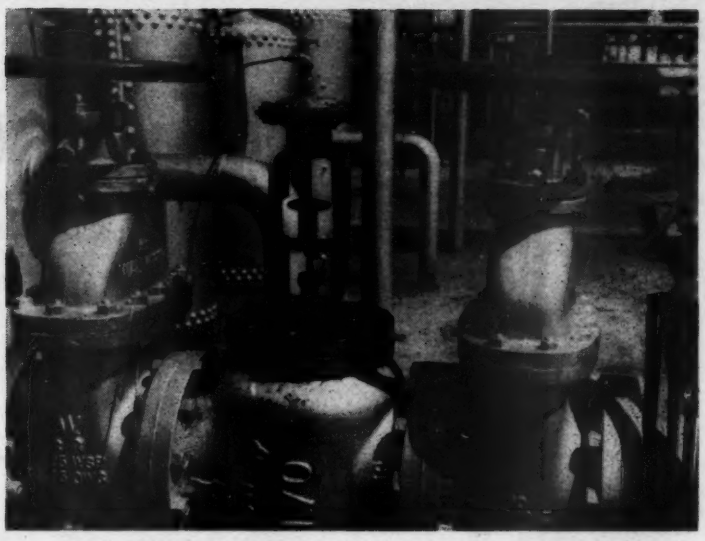
PLANT PRACTICES

Operations Indicator

AS a reminder to the man on duty at a gasoline plant, and to the succeeding shift, an operations indicator has been found valuable. It is made by using a circular sheet of light sheet metal—although waterproof cardboard can be substituted—enclosed in a circular retainer with four short lugs for attaching to the back of the work desk with common wood screws. A V-shaped slot is cut from the top of the retainer as wide as required, so that lettering on the indicator can be easily read. The indicator is supported on a shaft fitted with a thumb nut so that it can be turned easily. Lettering on the indicator can be anything pertinent to the plant. For example, if two battery chargers are in the plant, it is obvious that one or both may be needed. Movable pointers behind the indicator are placed on a pin so they can be set over the number of the charger in use. In this illustration, battery charger No. 2 is in use. If tour change comes before the batteries are fully charged, the relief operator can see instantly which is to be looked after.

Spring Loaded Valve Converted From Dead-Weight Regulator

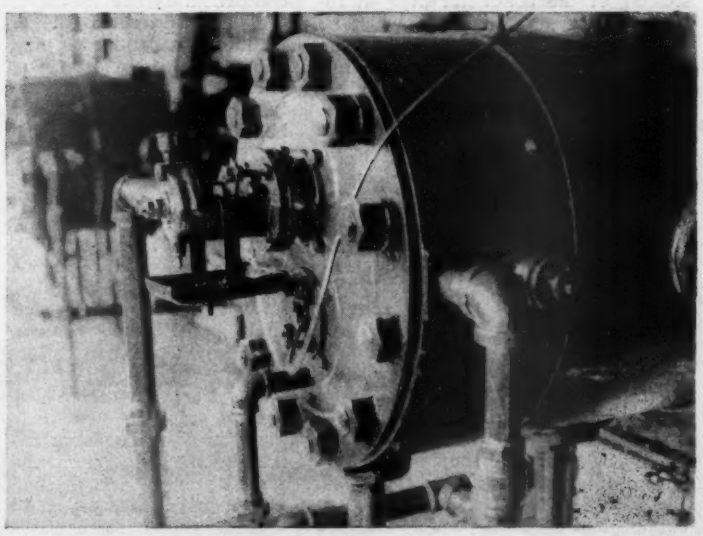
THE spring loaded regulator shown in the accompanying picture originally was a dead-weight regulator used as a back-pressure regulator on a low-pressure absorber. As a dead-weight regulator it did not hold a constant pressure, and since a spring loaded regulator of this size could not be obtained, operators of the plant attempted the conversion. The converted regulator can be operated from any pressure-control instrument. Being too short, the yoke of the dead-



weight regulator was cut and spliced to give room for the installation of the spring and adjusting wheel. The stem in the diaphragm head was replaced with a threaded stem so the wheel could be adjusted and hold enough tension on the spring to make the valve close. The strength of the spring to be used depends on the size of the diaphragm head and working pressure of the valve.

Automatic Economizer for Gas-Engine Fuel Feed

THE economizer fuel valve attached to the cylinder head of the gas engine shown in the accompanying picture originally was operated by a rocker shaft with adjusting tappets. The rocker shaft was supported by a bracket attached to head stud bolts, and an eccentric rod ran from it to an eccentric on the crankshaft. With it the engine operated with a fuel pressure of 15 to 18 lb. By removing the bracket and rod, cleaning the valve, packing the valve stem with soft packing, and taking the spring from the valve, the valve now operates under a fuel pressure of only 8 to 10 lb., eliminating the danger of burning the front of the piston and head with too high-fuel pressure, and also the need for continuous tappet adjustments which had been occasioned by expansion and contraction of the eccentric rod. Along with this, substantial savings in fuel consumption have been realized. When tappet adjustments were affected by the expansion and contraction of the eccentric rod, often excessive volumes of fuel were admitted to the cylinder before the necessary adjustments could be made. Now the fuel feed is constant at any desired volume. Without the eccentric rod, the valve operates with the stroke of the piston, being closed by the compression of the compression stroke and opened by the pull of the expansion stroke plus the feed pressure.



Correct Spacing Increases Gas-Lift Efficiency

by Harry F. Simons

THE ability of gas lift to handle considerable foreign material in addition to the normal fluid coming from the formation is due to the fact that the produced fluid does not pass through the working parts of the system. Fluid can thus be lifted from very close to the bottom of the well without causing an increase in the maintenance work and pulling jobs required.

Shale and sand falling into a well bore eventually enter the standing valve and when enough of this material accumulates to cut off production the situation is described as "sanding up." This occurs frequently in some wells. If the collection of material on the top of the standing valve is to be prevented, it must be continuously removed.

Present gas-lift practice in low-fluid-level wells is to use intermittent injection in which the gas is admitted from the annular space to the accumulation chamber below a packer and a bottom-hole-operating valve and forces the fluid upward through a conductor pipe, into the tubing and thence to the surface.

The standing valve is on the bottom of the accumulation chamber and to prevent the collection of any material there it is necessary that the bottom of the conductor pipe be located as closely as possible to the standing valve. In other words, the spacing of the conductor pipe in relation to the standing valve must be the correct one for this purpose. The spacing of these two items is as important as the spacing of the valves on an oil-well pump.

Establishing Correct Spacing

Establishing the correct spacing is not difficult and has been found to be about 6 in. Where gas is supplied from the surface or where gas is obtained from a formation opposite casing perforations, a hook-wall packer which does not telescope is used. Spacing of the conductor tube and the standing valve can be made on the surface and does not change during the setting of the packer.

If the gas for lifting the oil is obtained from an exposed formation below the bottom of the casing a formation-type packer is employed. Downward movement is required to expand and set such packers and the spacing of the conductor pipe must be such as to allow for this telescoping effect.

The accompanying diagram shows schematically the assembly used. It consists of (1) a bottom-hole-operating valve which controls the movement of gas into the accumulation chamber and the movement of produced fluid into the tubing; most commonly used are valves opened and closed by a weight suspended from a wire line attached to a timing device. (2) An accumulation chamber which is attached to the tubing below the bottom-hole-operating valve. (3) A conductor pipe which is attached to the bottom-hole-operating valve and is inside the tubing and accumulation chamber. (4) The packer which is attached to the tubing below the bottom-hole-operating valve and above the accumulation chamber. (5) The standing valve which is attached to the bottom of the accumulation chamber.

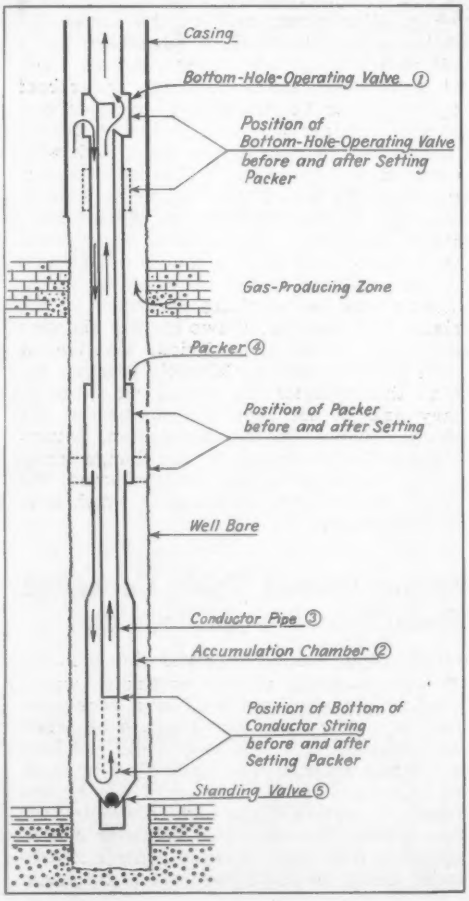
In setting the packer, the tubing is turned to release the slips and then it is lowered to expand the packer. This produces a telescoping effect as far as the relation of the conductor pipe to the accumulation chamber and standing valve is concerned. If the travel of the packer in setting is 18 in. then the conductor pipe approaches the standing valve that much. Obviously, if sufficient allowance has not been made for this travel, the conductor pipe will sit down on the standing valve and the system will not function.

If the spacing is too great, the system will work but the accumulation chamber will not be exhausted each time gas is admitted and sand and debris will collect on top of the standing valve. For this reason the bottom of the conductor pipe should be approximately the 6-in. from the standing valve mentioned above, which means that when the equipment is assembled on the floor for running in the hole the conductor pipe should be about 24 in. from the standing valve. If a packer requiring more or less travel to expand is used, the spacing will have to be adjusted accordingly.

Setting Effect

Correct spacing permits a jetting or siphoning effect when the gas has forced the oil or the fluid from the accumulation chamber upward through the conductor pipe and finally breaks around and starts into the conductor pipe. Where volume control is being used gas is admitted to the accumulation chamber until the produced fluid reaches the surface and shuts off the gas. This means that a considerable quantity of gas at a fairly high velocity passes through the accumulation chamber, past the standing valve and into the conductor pipe. Where time control is employed, the time during which gas is admitted can be so adjusted that the accumulation chamber is completely emptied during each lifting period and sufficient excess gas put through to insure removal of any material apt to interfere with the action of the standing valve.

Gas lift assembly


Casing
Bottom-Hole-Operating Valve ①
Position of Bottom-Hole-Operating Valve before and after Setting Packer
Gas-Producing Zone
Packer ④
Position of Packer before and after Setting
Well Bore
Conductor Pipe ③
Accumulation Chamber ②
Position of Bottom of Conductor String before and after Setting Packer
Standing Valve ⑤

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REFINING

by Arch L. Foster

Action Promised on Patent System Revision Recommendations

SEVERAL bills will be presented to Congress from the patents committee soon to carry out the recommendations of the Patent Planning Commission for revision of the national patent system, the chairman of the congressional patent committee announced late in July in a letter to Speaker Sam Rayburn. The commission was appointed in 1941 by the president, with "Boss Ket," Charles F. Kettering as chairman. It was saddled with the duty of studying thoroughly the present patent system and of recommending changes and improvements which will eliminate or reduce these abuses.

The bills each in turn will take up the main recommendations of the commission's first report, which include the following: (1) Compulsory recording of contracts made under or involving patents; (2) compulsory licensing of patents involving national defense; (3) establishment of a policy of the Government for tests or standards of patentability and of invention, so that the patent office may issue reports on the validity of patents under consideration in infringement suits, and (4) the establishment of a single court of patent appeals. These recommendations cover the main findings of the commission on abuses or on shortcomings of the patent system as it is operated at present; in the opinion of the commission expressed in its initial report, the correction of these evils and mending of these shortcomings will go far toward perfecting the existing system, which the commission emphatically states should be preserved in principle.

Which?—Democratic or Totalitarian Patent System?

In the formation of these bills, in the changes which they require, in the situation which they will be most instrumental in creating lies the greatest possible opportunity for a definite and far-reaching advance or retreat, to right or left in our governmental and industrial economy. Their information and passage holds the greatest promise for and the most subtle danger to our further industrial, economic and sociological development along free-enterprise-fostered democratic lines. Planned and arranged to improve the patent system as a spur to free individualistic enterprise and private progress, and as a protection to invention and research, the improved patent system can and will prove to be one of the greatest advantages to the entire nation, high and low. Built on the totalitarian principle of enforced sharing of the results of work, brain effort, research and invention by some with others contributing nothing to the common weal; committed to the conversion of private property—patents the result of individual enterprise and therefore private property—to the common welfare without recompense to owners of that private property—which constitutes confiscation of private property by the Government—these bills can become the most devastating force conceivable in the destruction of our industrial civilization.

Let's Not Go Wrong on Oil Shale Study

IN the scramble of thinking on petroleum substitutes, it is heartening to find what we believe are straight and practical conclusions in the minds of interested and informed governmental technical leaders. We refer specifically to oil shale and shale oil. We do not imply at all that such straight thinking has not been indulged in on other substitutes.

On small pilot-plant scale the retorting of shale has been studied to a considerable extent by engineers of the petroleum division, U. S. Bureau of Mines, the names Gavin and later Kraemer standing out as directors of this pioneer work. Much information was obtained regarding retorting technique before the work was halted twice for lack of funds. Much more information is needed to round out the operating technology of shale retorting to recover the oil which resembles coal tar in many of its properties.

Pilot Plant for Refining Research?

Our knowledge of shale-oil refining is inexcusably meager even as a research-caliber proposition. It does not behave like petroleum although containing a large proportion of petroleum-type hydrocarbons. Refining study of the shale oil produced in the 1920's in Colorado and sent to several petroleum research organizations was not carried to reasonable limits for obvious reasons—lack of funds or of interest.

While experienced technologists do not reach total unanimity of opinion, it is agreed generally that retorting experiments should be carried out in units of experimental capacity, say, one or two standard-sized units, instead of 10 or 20 such units as would be found in a commercial plant. Data from standard-sized units can be translated directly into commercial-plant figures of any size, they point out; in shale retorting, physical conditions and physical properties affect the results obtained very widely. Innumerable problems are encountered in shale retorting which are absent in petroleum distillation. It is believed that single retorting units should be of commercial size or approaching that size. However, these same authorities disagree strongly with the idea that commercial plants be built. For example, a well-informed engineer executive states that in his opinion the Government may and should under the conditions find out and disclose how any desired results may be accomplished, but never in such case should the Government go into commercial production of shale oil and/or its derivatives. With this position several government technologists are understood to be in essential agreement.

Because of the greater practicability of translating smaller-than-commercial-plant-scale refining research into large-scale terms, it seems agreed by the majority of technologists approached that smaller pilot-plant units may be employed satisfactorily rather than commercial-scale units, and at greatly reduced expense. It is highly possible, they say, to divide an extensive program of refining research between a large or considerable number of refining research organizations in which interested government laboratories should participate, to determine general methods for refining this oil by different modern processes.

But again all technologists seem agreed that for the U. S. Government to go into commercial shale-oil production, refining or marketing is totally incompatible with a democracy's principles or functions.

COST ANALYSIS—WATER DISPOSAL

DISPOSAL of oil-field waste water is a major item of expense in many producing areas. Since such expense is essentially nonproductive, an added incentive exists to take advantage of every opportunity to reduce investment costs and repair expense. Several different methods for disposal of the brines may be available and in such an instance a careful cost analysis of both the original investment and estimated future repair expense is essential.

A cost analysis of proposed salt-water operations for a lease is summarized in Table 1. This particular lease is located in an area where state laws and consideration of personal property rights, make underground disposal of salt water necessary. The estimated maximum water production from the lease is 3,600 bbl. per day.

TABLE 1

1. Cost of system—drill and complete new disposal well:	
Drill and equip well—rotary contract	$23,600
Surface lines and other equipment	500
Total estimated cost	$24,100
2. Cost of system—use dry hole, cable-tool contract:	
Drill deeper and equip well	$9,500
Surface lines and other equipment	9,150
Total estimated cost	$18,650
Savings over drilling new well	$5,450
3. Cost of system—use dry hole—rotary contract:	
Drill deeper and equip well	$10,600
Surface lines and other equipment	9,150
Total estimated cost	$19,750
Savings over drilling new well	4,350

Methods Available

Two possibilities for disposal of the salt water existed. Either a new well drilled on the lease or a dry hole, approximately 9,000 ft. distant from the lease tank battery could be utilized as an input well. Use of the dry hole, however, would necessitate installation of 6-in. pipe from the tank battery to the well. It also would be necessary to drill the well approximately 200 ft. deeper to a zone suitable for the injection of waste water. Data secured from other disposal wells in the same general locality, indicated that this disposal zone would handle all of the lease water production by gravity flow. Fig. 1 shows the estimated input capacity through 3-in. cement-lined tubing. The factor "K" represents the amount of salt water injected in barrels per day per pounds per square inch increase in bottom-hole pressure. For other input wells in the same locality the value "K" was approximately 40 bbl. per day per pound per square inch. It will be noted from the chart that a disposal well drilled into this zone would have an estimated capacity of 5,300 bbl. per day, if equipped with 3-in. tubing.

Cost Comparison

A cost comparison between drilling a new well from the surface and deepening the dry hole is shown in Table 1. Utilization of the dry hole was considered both on the basis of cable-tool and rotary contracts. The costs for drilling and equipping the selected well, included drilling expense, costs of materials, cementing, acidizing, tubing, labor and overhead expense.

It will be noted that a considerable savings can be effected by drilling the dry hole deeper and installing a water line to the well. Another factor which might be considered is the flexibility of the proposed system with respect to handling water production from other leases. In order to reduce original investment costs, many operators have formed waste water associations whereby several companies may use the same disposal well.

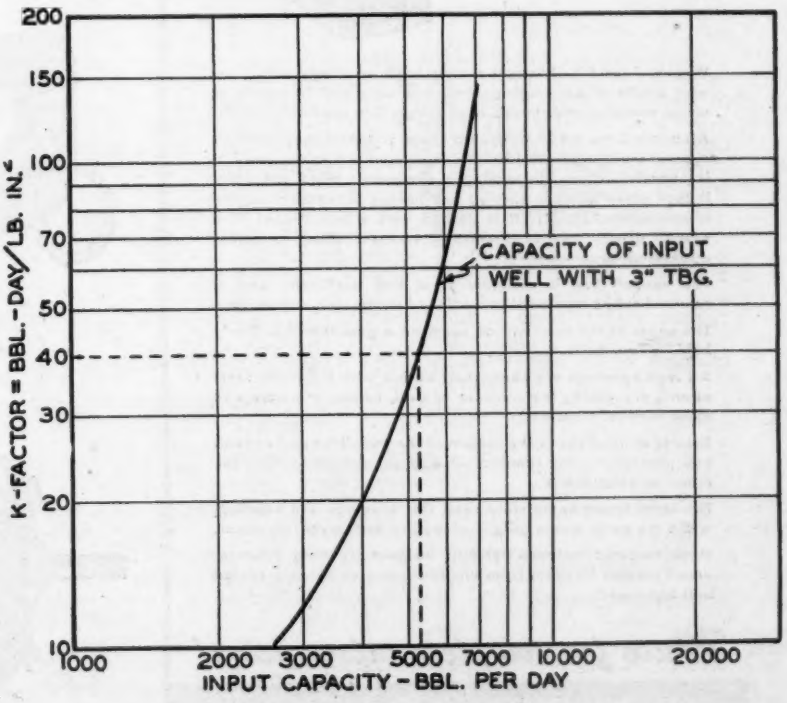

Fig. 1

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These motors are especially designed to resist the damaging action of acids, fumes, moisture, and other destructive elements. They are ideal for chemical manufacturing plants, as well as in industrial plants where operating conditions are adverse to the use of open-type motors.

Features of Construction

Wagner Type CP Chemical Motors have windings which are well insulated and impregnated, and coils and free-ends of stator windings are shaped to fit snugly into special slot coils.

After windings are in place, the stator is baked to remove all moisture, and while still hot it is immersed in a heavy insulating varnish. When this coating is completely dried, the stator is then given another dipping and baking to insure complete impregnation. Finally, it is treated with a heavy coat of a special alkali- and acid-resisting varnish, which produces a tough oil-proof coating.

The conduit box is moisture-proof and dust-tight, and is screwed onto a nipple solidly welded into the side of the motor.

The cover of the conduit box seats on a gasket and is firmly held by four bolts.

All lead openings are completely sealed with a flexible compound, preventing the entrance of dust, fumes, moisture and other harmful elements.

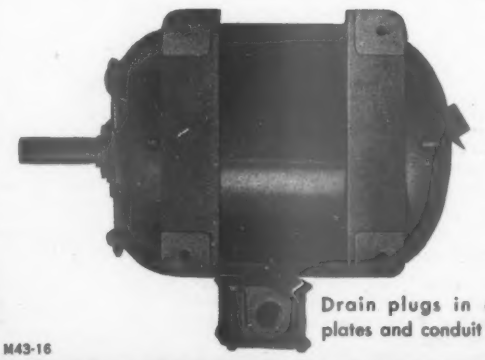
Special drain plugs in the bottom of the endplates and conduit box provide for the removal of any condensation from the motor or conduit box.

The inner frame completely seals the windings and bearings while the outer frame guides a cooling draft over the motor.

Other features include: dynamic balance (running balance) which insures freedom from vibration; and completely sealed ball bearings.

Conduit box—screw-on type.

Completely sealed leads.



Drain plugs in endplates and conduit box.

M43-16

Write for complete information!

Wagner Electric Corporation

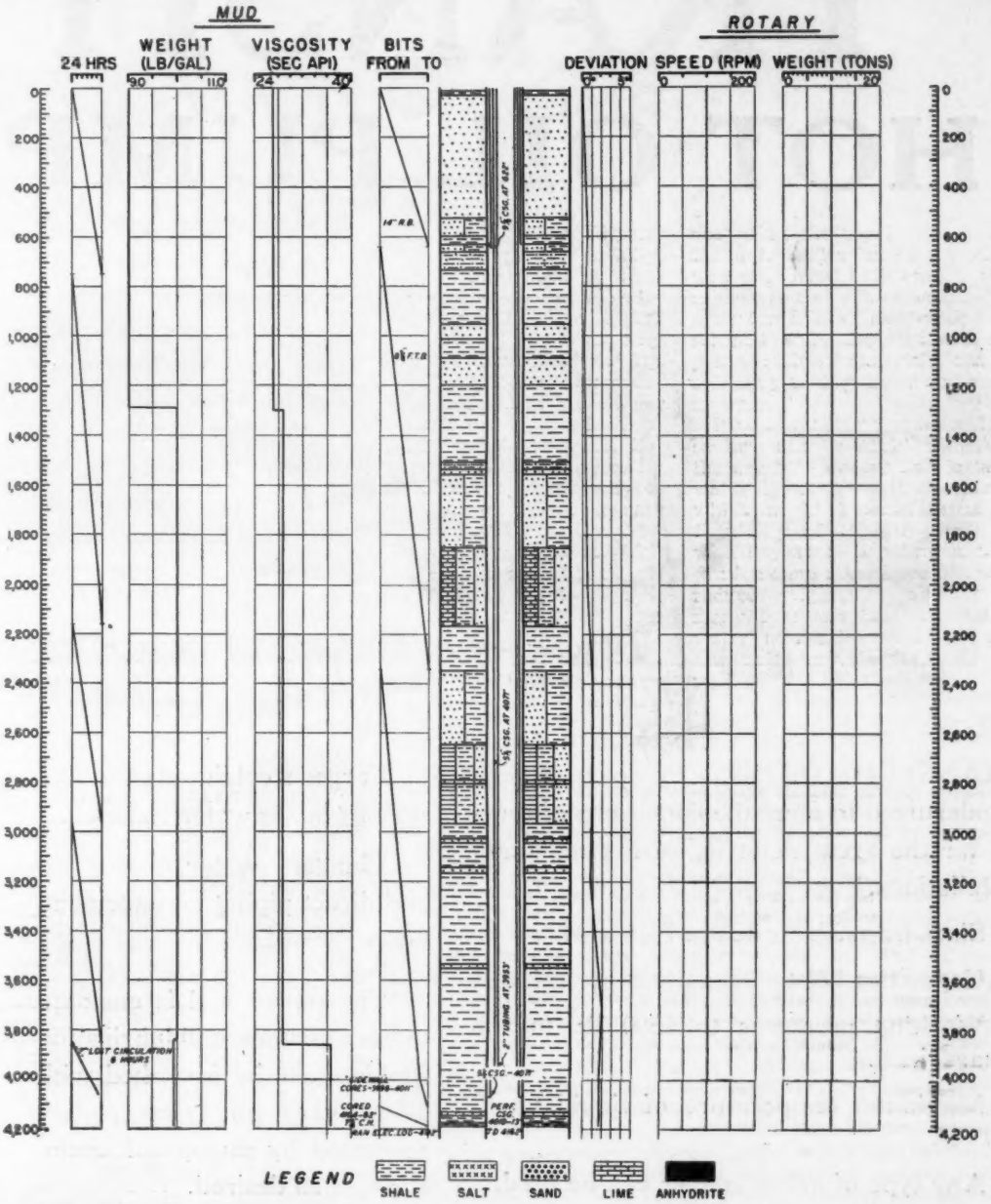
ELECTRICAL AND AUTOMOTIVE PRODUCTS

Journalog

Discovery Well, Porter Pool, Karnes County, Texas

EDWIN B. COX and J. L. HAMON 1 BEN JOHNSON
Victor Blanco Survey, Karnes County, Texas

CONTRACTOR
Gorman Drilling Co., San Antonio, Tex.



DRILLING DATA

Well elevation, derrick floor	269 ft.
Date started rigging up	6- 1-43
Date completed	6- 2-43
Date started drilling rotary	6- 3-43
Date set casing rotary (O.S.)	6-11-43
Total rotary time	4 days
W.O.C.	3.33 days
	Hours
Logging (electric)	3
Coring	15
Circulating	21
Drill-stem test	None
Breaking down pipe and running casing	10
Trips	8
Repairs	None
Shut down for orders	None
Shut down, lost circulation	14

COMPLETION

Gun perforating	2½ hr.
Number shots	8

CORE HEADS USED

Type	Number	Size (in.)
Three-blade	1	7¼

MUD USED

Type	Amount
Aquagel	6 sacks

CASING AND TUBING RECORD

Size (in.)	Weight (lb.)	Depth (ft.)	Cement (sacks)
9⅝	..	807	350
5½	14	4,071	250
2 EUE	4.70	3,953	...
4 liner	11.60	4,020	...

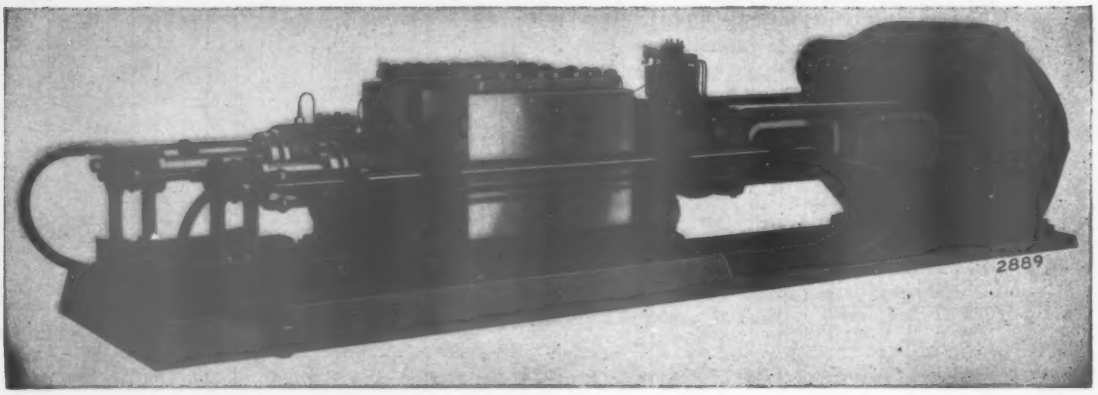
BITS USED

Type	Number	Size (in.)
Rock bit	1	14
W.I.B. fish tail, two-blade	2	8¼

PRODUCTION TEST

Date	6-21-43
Time flowed	24 hr.
Choke	5/32
Tubing pressure	540 lb.
Casing pressure	1,000 lb.
Separator pressure	40 lb.
Oil	114.34 bbl.
Water	None
Gas	83,600
Gas-oil	404:1
Gravity	47
Producing horizon	Petrus sand

TRANSIT
HOT OIL PUMPS



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Engineering Fundamentals No. 108

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

APPLICATION OF CORE-ANALYSIS DATA

THE principal use of core-analysis data is as a basis for calculation of the amount of oil in place in a given reservoir or under a tract of given extent and an estimation of the fractional part of that oil that may be recovered. Such calculations make direct use of porosity and water-and-oil-saturation determinations that have already been described in this series and also often apply indirectly the measurements of permeability.

The permeability values are used in connection with an indirect determination of interstitial water content, since it has been found that in many fields there is a usable correlation between permeability and interstitial water content. Use of oil-base mud or a tracer, as mentioned in Installment 104, is an expensive process and may be necessitated only to a sufficient extent that enough interstitial water determinations are made to draw a curve similar to curves of Fig. 1.* Curve A is applicable to

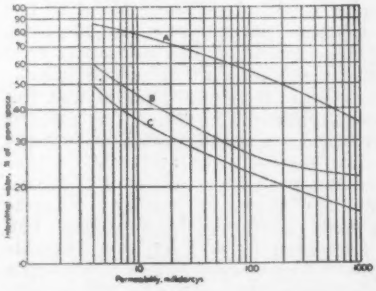

Fig. 1

the Anahuac, Tomball, and Richfield fields; curve B is applicable to the Dominguez field, and curve C applies to the East Texas field. Such data used wisely may supply fairly accurate estimates of interstitial water content based on permeability values in other similar fields. At least, in the absence of any better source of information, such a correlation should yield better results than a random guess.

*Reproduced from "Core-Analysis Interpretation," by Norris Johnston, A.P.I. Drilling and Production Practice, 1941. (Curve A based on data reported by Schilthuis, and by Pyle and Jones; Curve B based on data reported by Sherborne, and Curve C based on data reported by Schilthuis.)

Content of Core

As a foundation for proper interpretation of core-analysis data, it must be realized that the fluid contents of a core sample as it is obtained at the surface do not even closely approximate the original fluid contents of that sample before it was disturbed by the drilling process. By the conventional method of rotary coring two conditions are operative which cause alteration of the fluid content of the core before it reaches the surface. The first of these conditions is the downward movement of water from the drilling mud ahead of the bit, which flushes out a great part of the oil originally present and contaminates the interstitial water. Contamination of the core with water from the drilling mud may also proceed further in the form of radial entry of water into the core after it is reached by the bit. This latter type of entry is of greater significance in sands of relatively low vertical permeability and high lateral permeability.

The second condition which alters the content of the core sample before it reaches the surface is the expansion of contained fluids (particularly gas) as the pressure is reduced while bringing the core from the bottom of the well to the surface.

The net result of the two altering conditions just mentioned is that the oil content of the core at the surface should closely approximate that oil content that could not be recovered by ordinary production methods. This is a logical assumption, because the core sample has been subjected to two artificial processes very similar to the natural influences that clean a sand body when oil is produced from it. That is, the flushing by drilling water simulates a natural water drive, and the pressure reduction as the core is brought to the surface is somewhat similar to the pressure decline of a field, although both artificial processes are of shorter duration than the two corresponding natural processes.

Now when using data from a rotary core, taken with water-base mud, the oil recovery possible by complete water drive may be estimated by the method described below.

First, the interstitial water content must be known. As already indicated this may be available as a result of direct measurement of the water content of a core sample taken with oil-base mud or by use of a tracer which makes possible a correction of laboratory water-saturation test results to obtain the true interstitial water content. Or, in the absence of a better procedure, the permeability of the sand may be used for reading the corresponding interstitial water saturation from a curve of the type given in Fig. 1 based on data previously obtained from another similar field.

Oil Content

Second, the volume of total oil originally in place in the sand (provided the core was taken from a productive oil zone, as distinguished from a gas-cap area or merely oil-wet sand) may be assumed to be equal to the total volume of pore space minus the volume of space occupied by the interstitial water.

In working with a high-pressure producing zone another factor must be included here, which involves a consideration of the amount of shrinkage that occurs in the oil volume due to release of gas from solution. A barrel of surface oil (as received in the stock tanks) may have contained a considerable quantity of gas in solution when under a high pressure in the reservoir; and the volume of the barrel of surface oil plus its dissolved gas may occupy considerably more than a barrel of space in

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

the sand. The method of measuring this shrinkage due to release of dissolved gas will be discussed later in this series. For the present purpose, it is sufficient to say that this shrinkage relationship is commonly taken into consideration by using a "formation volume factor." The formation volume factor represents the volume of reservoir space occupied by a barrel of surface oil plus its dissolved gas when it existed in the sand. To further clarify the term, consider what is meant by a formation volume factor of 1.25. This means simply that 1.25 bbl. of reservoir pore space (exclusive of space occupied by interstitial water) is occupied by 1 bbl. of stock-tank crude oil and the gas dissolved in it.

Another means of expressing this difference in volume between stock-tank oil and reservoir oil consists of reporting "per cent of shrinkage." The per cent of shrinkage, as generally used, is the rate of the difference between reservoir oil volume and stock-tank oil volume to the stock-tank oil volume, expressed as a per cent.* Thus, if one says the shrinkage is 25 per cent, that is equivalent to saying that the formation volume factor is 1.25.

Formation Volume Factor

When the use of the formation volume factor is necessitated by large amounts of gas dissolved in the oil in the reservoir, the following procedure may be used. The volume of space available to contain oil (obtained by subtracting interstitial water volume from the total pore volume) is divided by the formation volume factor to obtain the barrels of surface oil originally present in the sand. In this connection "surface" oil is somewhat of a misnomer, because some oil is nonrecoverable and never reaches the surface, but it does represent the volume of oil that would result if the pressure on all of the oil originally present in the reservoir were reduced to atmospheric pressure and the gas thus allowed to come out of solution.

As a next step, the oil saturation observed on a core sample test in the laboratory is subtracted from the total surface oil originally present to obtain the amount of recoverable surface oil.

Generally speaking, recovery of oil obtained by a complete water drive is higher than that obtained by gas drive or pressure depletion methods. Thus, if it is expected that production practices or reservoir conditions in the field under consideration will be such that a natural water drive will not be effective in the depletion of the field, the estimated recoverable oil from the field may be somewhat less than that obtained by the method of calculation described above. However, some fields produced in the absence of a natural water drive may yield considerable additional oil if an artificial waterflood is employed. In such a case the method of estimation described above should give a reasonable estimate of the oil physically recoverable by both primary and secondary-recovery methods.

Example

Problem. — Given the following core-analysis data concerning a well:

Average oil saturation of core sample as determined in laboratory, per cent of pore space equals 31.5.

Average porosity of oil-producing zone, per cent, equals 19.8.

Average permeability of sand equals 225 md.

Formation volume factor equals 1.5.

Core obtained using conventional rotary core barrel and water-base mud.

Curve A of Fig. 1 is considered applicable in this field.

Estimate the amount of oil recoverable from the sand adjacent to this well by complete water drive, barrels per acre-foot.

Solution.—One acre-foot is equivalent to 7,765 bbl. (Installment 1).

The pore space contained in 1 acre-foot of the sand surrounding this well is $0.198 \times 7{,}765 = 1{,}540$ bbl.

Referring to curve A of Fig. 1, it is found that the interstitial water saturation corresponding to a permeability of 225 md. is 48 per cent.

Then, the volume of space available for containing oil in 1 acre-foot of this sand is 1,540 (1.00 — 0.48), or 800 bbl.

The volume of surface oil that this is equivalent to is 800/1.15, or 695 bbl.

The volume of nonrecoverable oil in an acre-foot of the sand is $0.315 \times 1{,}540$, or 485 bbl.

Then, the recoverable surface oil from an acre-foot of the sand adjacent to this well is estimated to be 695 — 485, or 210 bbl. This figure represents the physical maximum that could be recovered by water drive, whereas the amount that can be economically recovered will generally be less. Experience is the only yard stick by which one can decide how much the economically recoverable oil will fall below the physically recoverable oil. Johnston* suggests, merely for illustrative purposes, that the practically recoverable oil may be of the order of 65 per cent of the physically recoverable oil. He makes it clear, however, that such a figure is arbitrarily chosen for his example and that experience and operating policy must govern this factor in any particular case.

Expected Recovery

It is unfortunate that at present no method has been devised by which the expected recovery of oil by gas drive can be estimated from core-analysis data. The closest approach to a solution of this problem consists of assuming that the gas-filled space found in the laboratory core sample is the same as the gas-filled space that would result in the reservoir after depletion by natural-gas drive processes. Applying this method, the expected recovery by gas drive is estimated to be equal to the volume of pore space minus the total water content of the laboratory core minus the oil content of the laboratory core. It is questionable that the assumptions upon which this method is based are valid enough to warrant using the method. It is believed that by the time the cutting of the core at the bottom of the hole is completed the water drive process due to flushing by drilling water has already removed all of the recoverable oil before the core leaves the bottom of the hole. Thus, the gas expansion that occurs in raising the core to the surface is limited to the amount of gas dissolved in this relatively small amount of nonrecoverable oil. Also, the liquid available to be forced out by the expanding gas is not at all representative of the original liquid content of the formation. Because of these weaknesses, the use of the method mentioned is not recommended. Other simpler methods of guessing are less cumbersome.

*There is no reason that shrinkage could not be expressed as a per cent of the reservoir oil volume rather than surface oil volume so long as it is applied properly in calculations, but the other basis for the percentage is more commonly used.

*Reference cited as source of curves of Fig. 1.

REFINING

First Unit on Stream at Frontier's Aviation Plant

CHEYENNE, Wyo.—The first unit of Frontier Refining Co.'s new $5,000,000 aviation-gasoline plant near Cheyenne went on stream last week. The new crude-oil unit which has started operation is producing charging stock for the catalytic cracker.

All facilities in the new plant will be ready to operate in about 30 days. Approximately 100 men have been added to Frontier personnel for operation of the new plant.

Richfield Expansion Program Under Way

LOS ANGELES, Calif. — Richfield Oil Corp., through the Defense Plant Corp., will soon start erection of a new unit at its southern California refinery to cost about $13,000,000 and which upon completion will more than double the company's production of 100-octane aviation gasoline. Blue prints and plans have been completed and the necessary priorities have already been granted. Actual construction is scheduled to get under way within the next 30 days and the new unit should be in operation by next July unless some unforeseen delay arises.

The construction contract has been awarded and fabrication of equipment will be given the go signal immediately. The unit to be erected will be a Thermofor catalytic-cracking process designed by the Lummus Co. and licensed by the Houdry Process Corp. and is designed to use some of the extensive equipment in Richfield's refinery. The installation under consideration will be limited to the production of aviation gasoline and the normal production of other products incident to operation. Richfield Oil Corp., of which Charles S. Jones is president, is controlled by Consolidated Oil Corp. and Cities Service Oil Co.

A decision was reached about a year ago on the part of the company not to engage in the production of butadiene, principal component of synthetic rubber, and nothing has de-

Sketches of Plant Operators

F. P. DODGE, works manager at the Texas Co.'s Port Arthur, Tex., refinery for the past 4 years, has been appointed assistant to the general manager of the refining department. He has been assigned to special duties and will remain in Port Arthur.

Mr. Dodge is one of the oldest employes of the Texas Co. in point of service. He was graduated from Pennsylvania State College, and went to Texas in the early 1900's. He started with the Texas Co. in February 1906, as a yard foreman at Port Neches. In March 1907, he was assigned to supervise the construction of the company's West Dallas (Texas) works and in March 1910, was made superintendent of that plant.

He was transferred to Lockport, Ill., in 1911, to supervise the construction of the refinery there.

He became assistant superintendent of the Port Arthur works in 1914 and in 1918 he became general superintendent.

Promotion to the position of works manager came in May 1939.

For many years, Mr. Dodge has taken an active part in the civic life of Port Arthur, has served the Board of Trade as president and is an active member of the Rotary Club.

He is a native of Michigan.

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NITROSE is a corrosion resisting application for metal surfaces—it is not to be confused with so-called "protective paints." *NITROSE* welds itself to surfaces to which it is applied, forming a bond which will not chip, crack or peel; expands and contracts with the surface covered, effectively resisting corrosive action of water, acid fumes, alkalis, brine and high temperatures.

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veloped to change this original program. The company is, however, delivering certain refined products to be processed by others in the production of butadiene.

Pemex May Combine Four Tampico Refining Plants

Probably one of the largest single refinery construction projects contemplated for the North American continent as soon as materials are available involves erection of one large consolidated plant at Tampico, Mexico, replacing four separate refineries expropriated from private companies in 1938.

Officials of Petroleos Mexicanos, the government petroleum agency, are convinced that the four existing Tampico refineries should be consolidated into a single efficient manufacturing unit. The four Tampico plants were formerly owned and operated by Compania Mexican de Petroleo "El Aguila" (Shell); Huasteca Petroleum Co. (Standard of New Jersey), and Pierce Oil Co. (Sinclair). According to Petroleos Mexicanos, the Tampico refineries have a combined crude-oil capacity of 86,000 bbl. daily. Three of the refineries have cracking plants with aggregate capacity of 17,500 bbl. daily.

Another refinery construction project under consideration by Pemex embraces expansion of distillation capacity at the Mexico City plant. The additional crude-oil capacity is practically a requisite to efficient operation of the $10,000,000 aviation-gasoline plant currently authorized for construction at Mexico City. Contract for the aviation-gasoline plant and, it is understood, for increasing capacity of the crude-oil line from the Poza Rica field, has been awarded to a Cleveland engineering firm.

DPC Increases National Contract by $1,660,000

COFFEYVILLE, Kans. — Expenditure of $1,660,000, in addition to a previous commitment of $3,160,000 for aviation-gasoline facilities at National Refining Co.'s plant here, was authorized last week by the Defense Plant Corp. The over-all outlay for new facilities now standing at $4,800,000 will qualify the National refinery here for substantial production of aviation gasoline, although capacity and specific details on the authorized installations are military secrets.

Capacity of the refinery has been expanded to 12,000 bbl. of crude daily by modernization of certain facilities, an increase of approximately 3,000 bbl.

Acquisition of the National Refining Co. by Otis & Co., Cleveland, is pending stock pledges.

Three Minor Construction Projects Cancelled by WPB

WASHINGTON, D. C.—Three minor refinery construction projects were cancelled last week at request of the operating companies which asked War Production Board to cancel preference ratings, covering the scheduled equipment.

Revocations issued by WPB were: Continental Oil Co., Ponca City, Okla., naphtha reforming unit, estimated cost $128,728; Humble Oil & Refining Co., Houston, Tex., butylene unloading equipment to cost $15,600, and Socony-Vacuum Oil Co., Inc., New York, for increased pumping facilities, estimated cost $35,650.

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Type UG integral geared unit with low speed shaft extended for "V" belt drive. Rated 500 H.P. and equipped with oil pump double oil relay governor for variable speed and close speed regulation.

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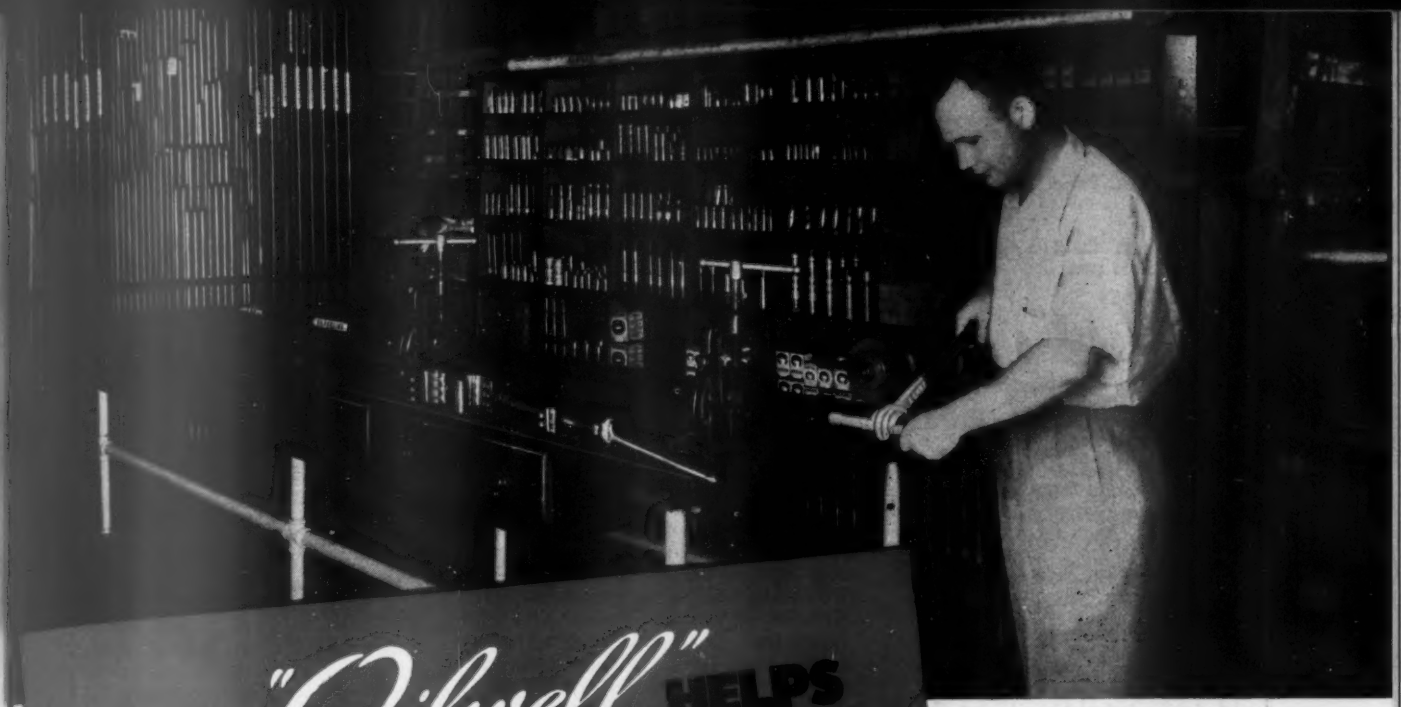

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New Jersey Lateral of WEP To Go in Operation Soon

Testing of the 20-in. lateral of the War Emergency Pipelines, Inc., crude-oil system east of Phoenixville, Pa., was being completed early this week and this line for delivering to refineries in New Jersey and New York is scheduled to be in service before the week is over.

Capacity of pump stations of the eastern extension between Norris City, Ill., and Phoenixville, is 225,000 bbl. It will probably be November 1 before fittings will arrive which will make it possible to deliver at the rate of 300,000 bbl. daily to Phoenixville, Pa.

The WEP 20-in. products line with its feeder system is now completed solid to Seymour, Ind. More than 1,200 miles of 20-in. has been laid and less than 285 miles remains to go in the ground east of Seymour. Laying is progressing at the rate of 7 miles per day. Pumping of products from Beaumont, Tex., is not expected to begin until early in November when it is expected that sufficient fittings will be on hand to start operations.

Magnolia Awards Contracts For West Texas Outlet

DALLAS, Tex.—The Magnolia Pipe Line Co. Friday let contracts for construction of its 337-mile, 12-in. crude-oil line from Midland to Corsicana, Tex., to the Oklahoma Contracting Co. and Jones & Brooks of Dallas. When completed the line will have a capacity of 42,000 bbl. daily.

Bulk of the work, which includes the first three sections of the line from Midland eastward to the Bosque River, went to the Oklahoma Contracting Co., which tentatively has scheduled the start of the work for October 20 to 25. Probably the stove-pipe method of welding will be used on this portion of the line. It is understood that two or three spreads will be used on this section which is 256 miles in length.

The balance of the line, 81 miles from the Bosque River to Corsicana, went to Jones & Brooks and work is scheduled to begin sometime between November 1 and 10, or as soon after November 1 as delivery of pipe can be made. It is planned to use the pressure-weld method on this section of the line.

Existing pump-station facilities along the line will be enlarged by crews of the Magnolia Pipe Line Co. The new line parallels an existing 8-in. line of the Magnolia company.

The new line is scheduled for completion by March 1, 1944. Several cars of 12-in. are reported to have arrived at Midland, Tex., for Magnolia.

Sunray Oil Co. has laid 5 miles of 4-in. pipe from the north extension area to the Slaughter pool in Southeastern Cochran County, where it connects with the Magnolia system.

Electric Centrifugal Pumps For Stanolind 16-in. Line

Preparations are being made for the construction of pump stations at Slaughter, Tex., and Bretch, Okla., for Stanolind Pipe Line Co.'s 16-in. line to bring West Texas crude to Drumright, Okla. Stations will be built by the company's organization. Piping will be fabricated at the company shops at Tulsa. All of the pumps will be electric centrifugal.

The initial station at Slaughter, Tex., will have three pumps in series consisting of a single-stage pump raising pressure to 110 lb. and two 2-stage pumps. When all units on the line are in operation, the second pump will raise pressure 250 lb. and the third pump will raise pressure 350 lb. At the Bretch, Okla., station the two units are identical with the second and third units at Slaughter, Tex.

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Protection will be afforded by the following mercoid controls: In case of an emergency shutdown at Bretch, one unit at Slaughter will be shut down when discharge pressure there rises to 800 lb. Units at Bretch will be shut down if suction pressure drops to 30 lb.

Altogether the company will erect 15 tanks of 80,000 to 85,000-bbl. capacity, consisting of 8 at Slaughter, Tex., 3 at Drumright, Okla., 1 at Sycamore, Kans., and 3 at Freeman, Mo. In addition, there will be 10 tanks of 10,000-bbl. capacity along the line east of Freeman, Mo., for handling the West Texas crude-oil movement.

Bids for laying the line are due this week and it is expected that contracts will be let next week.

Cities Service Jobs Handled By Pipe Line Contractors

Work is now in progress near Wichita, Kans., for several jobs which Cities Service Gas Co. has contracted to the new firm of Pipe Line Contractors, Inc. These jobs consist of 16 miles of 16-in. take-up, reconditioning and relay, 2 miles of 12-in. take-up and relay, and the laying of 11 miles of new 20-in. pipe.

This construction firm has also contracted the laying of 30 miles of 8-in. for looping the Great Lakes Pipe Line Co.'s system near Kansas City. Mo., as well as taking up 19 miles of 6-in. for Bethlehem Steel & Supply Co. near Pawhuska, Okla.

Pipe Line Contractors, Inc., is directed by R. B. Stovall, president, general contractor, Sherman, Tex., and R. W. Jernigan, secretary-treasurer and general manager. Dan O'Shea and G. M. McLoughlin are associates. In addition to the headquarters in the McBirney Building, Tulsa, the company plans to have a Tulsa warehouse and office and warehouse at Houston, Tex. Office and warehouse are being established at Dallas, Tex., this week.

PIPE-LINE PERSONALITIES

PAUL R. HALBERT, partner in Oklahoma Contracting Co., was born near Humboldt, Kans., June 30, 1903. He attended public schools in that vicinity graduating from high school in 1923. After finishing high school, he started working for the Sinclair and Prairie pipe-line companies working in the gang. After about 2 years of this kind of work, he started oiling on a ditching machine and was soon operating this type of machinery. He worked as ditching machine operator and mechanic for different contractors up until 1928 when he joined the Oklahoma Contracting Co.

Mr. Halbert was gang mechanic for the Oklahoma Contracting Co. for 3 years and then was made general mechanic in charge of all construction equipment. He served in this capacity until 1938 when he become superintendent and worked as a gang superintendent until March 1941 when he was made a partner in the company.

Innovations in pipe lining with which he is identified are the stripping buckets he invented for stripping old lines and the straight-line ditching idea used successfully by the Oklahoma Contracting Co. on their 367 miles of WEP 24-in. line. Mr. Halbert is married and has his home in Dallas, Tex. At the present time he is located in Lancaster, Pa., where he has charge of construction for the Oklahoma Contracting Co. on the WEP 20-in. products line. Mr. Halbert's hobby is machinery, and he is continually making improvements in equipment for pipe-line construction work.

PAUL R. HALBERT

F.P.C. Approves of Cities Service Projects

The Federal Power Commission has approved the application of the Cities Service Transportation & Chemical Co. to build a 26-in. natural-gas pipe line from the Hugoton field in Texas County, Oklahoma, to its compressor station at Blackwell, Okla.

Also approved by the commission was the application of the Cities Service Gas Co. to construct a 12-in. loop line from Burbank to Tallant, Okla., contracted by Jones & Brooks.

Both companies, operating in Oklahoma, are subsidiaries of the Cities Service Co. of New York City.

Bechtel-Dempsey-Price have established field offices at Blackwell and Hooker, Okla. Work on the right-of-way is proceeding this week. Laying of pipe is expected to commence next week on Hugoton-Blackwell line.

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Our part in this fascinating drama of pipelining has again demonstrated the fact that the I. C. Little organization is fully capable of handling the toughest of jobs in pipe line construction. Upon completion of our assignment on the Big-Inch Crude Oil Line, which entailed conquering one of the most precipitous mountain terrains ever penetrated, work was begun on our section of the paralleling Little Big-Inch Line. Watch for further Announcements of our progress!

Natural Gas

Hope's Hugoton Project Indefinitely Postponed

WASHINGTON, D. C.—The hearing previously scheduled for October 5 on application of Hope Natural Gas Co. for permission to build a 22-in. line from the Hugoton field in Kansas and Oklahoma to West Virginia was postponed indefinitely by the Federal Power Commission. The postponement was suggested by representatives of the Hope company.

Tennessee Gas & Transmission Co. has been authorized to build a 24-in. line from near Driscoll, Tex., to West Virginia where connection will be made with distribution facilities of the Hope company.

Postponement of the Hope hearing, instead of outright dismissal, leaves the Hugoton line application pending on records of the FPC and presumably would be the top ranking project if the need for additional supply in the Appalachian area reaches an acute stage.

Opponents of the Hope pipe-line project had urged dismissal of the application, particularly in the light of a commission decision authorizing the Tennessee Gas & Transmission Co. to build a line from Southwest Texas to the Appalachian industrial area to bolster gas supplies for war production plants.

The War Production Board has promised priorities on materials for only one pipe line from the Kansas-Texas-Oklahoma gas fields to the Appalachian industrial area.

The authorization to the Tennessee company was conditioned on its ability to meet financing requirements, and complete construction in time to supply gas for the winter of 1944-45.

Pacific Coast Group Elects New Officers

LOS ANGELES, Calif.—E. L. Payne has succeeded F. M. Banks, vice president of Southern California Gas Co., as president of the Pacific Coast Gas Association. Other new association officers are: O. R. Doerr of San Francisco, vice president; D. G. Martin of San Francisco, treasurer, and F. F. Doyle, D. H. Perkins and A. H. Sutton, directors.

A. F. Bridge, president of the American Gas Association and vice president and general manager of Southern Counties Gas Co., opened the 2-day meeting in Los Angeles September 22 and 23 which marked the fiftieth birthday of the Pacific Coast association.

The meeting was devoted almost entirely to discussions of war related problems. The registered attendance exceeded 600 and nearly 700 gas men and their ladies were present at the dinner given in honor of the older members of the association. Fifteen of the 39 association members who this year complete 25 years or more of continuous membership were seated at the "Old Timers" table. C. O. G. Miller, a charter member with 50 years of membership, responded for the veterans.

A feature of the meeting was the exhibit of war materials which replaced appliances on the assembly lines of the member manufacturers. Twenty-two manufacturers participated in this exhibit and in addition there were exhibits by the Southern California Gas Co. and the American Gas Association testing laboratories.

Welda Gas Line Will Be Given Further Study

WASHINGTON, D. C.—Further consideration was promised here last week by officials of Cities Service Gas Co., to the proposed construction of 75 miles of 16-in. gas line from the Welda storage field in Kansas to supply consumers at Kansas City, Mo.

Willingness to give more detailed consideration to the Kansas City supply situation was expressed by Cities Service executives appearing before the Federal Power Commission.

Vice President O'Brien told FPC that at such time as steel is available, application will be made for a certificate.

Revisions in Hugoton Gas Order Considered

WICHITA, Kans.—Revisions in the basic proration order covering the Hugoton gas field in Kansas are under consideration by the Corporation Commission. Operators last week told the commission that proposed changes would make the order more workable.

"No radical revisions of the rules were recommended," said T. A. Morgan, conservation director of the commission. "The changes would merely clarify the order."

The commission also took under advisement the allowable for the field for the October 1 to March 1 period after Morgan testified that purchasers had placed their needs at 43,655,000,000 cu. ft. The figure, he said, was an increase of 12,771,000,000 cu. ft. over the same period last year.

The Oklahoma Corporation Commission held a hearing last week on its basic order covering the Guymon sector of the Hugoton field. The Oklahoma order is similar to that of Kansas.

Natural Gasoline

Capacity of 60,000,000 cu. ft. Planned for Pozo Rica Plant

Construction of a modern natural-gasoline plant in the Poza Rica field with capacity of 60,000,000 cu. ft. daily is proposed by Petroleos Mexicanos as one phase of general plans for rehabilitating and improving operating facilities. Included in the projected program for Poza Rica, Mexico's largest producing field, is a cycling plant with approximately 10,000 hp. of compression capacity.

The largest natural-gasoline plant in Mexico, rated at 30,000,000 cu. ft. daily capacity is in operation in the Poza Rica field. The plant, however, is incapable of handling all gas produced in conjunction with crude-oil operations, and approximately 20,000 cu. ft. daily of wet gas is burned as fuel, popped into the atmosphere or otherwise wasted. Plans for additional natural-gasoline capacity and installation of a cycling operation is indicative of the high position Poza Rica occupies in the long-term program for Mexican petroleum operations.

Residue from the natural-gasoline and pressure-maintenance operations at Poza Rica, according to Pemex plans, will supply a projected natural-gas pipe line to Mexico City. Private American capital, it is reported, may be employed in building the natural-gas line.

Panhandle Plants Yield 27,948 Bbl. Daily

The 39 active natural-gasoline plants in the Texas Panhandle recovered an average of 24,880 bbl. of gasoline in August, the Railroad Commission reported last week. The plants also reported production of 3,068 bbl. daily of butane-propane mixtures during the month.

Exploration and Drilling

IN all of the statements we see regarding the number of wildcats drilled and the number of discoveries, there is surprisingly little information on the question of what constitutes a wildcat or a discovery or what the average discovery means in terms of barrels of oil.

A well may be considered an extension well in many parts of West Texas if it is as much as 2 miles from production when the structure is known to be a big one. Similarly, in the Elk Basin field of Wyoming, a definition of a wildcat 1 mile or more from production would have meant that there were a dozen wildcats and a dozen important discoveries. East Texas in the early days would have had even more. At the same time, in many areas of complex structure, every well is a wildcat.

It is obviously impossible for any centrally located statistical organization to acquire enough knowledge of the details of every well and every structure to be able to settle the question of whether or not a certain well is a wildcat. Thus any attempt to define the term exactly may lead to a misleading statement. Probably the best definition of a wildcat is "a well whose chances cannot be accurately estimated by those who are familiar with the area in which it is drilled." In other words, a wildcat is what those who are familiar with it call a wildcat.

Obviously, a well even in the middle of a field which goes below previously drilled depths is a wildcat and anything found by such a well is a discovery, even though it is not a new field. It is what the state bodies call a new "common source of supply." A well remote from production, if successful, is also a discovery well, but such a well may later be proved to be an extension by the drilling up of the intervening area, even though the fields are not officially consolidated. In other words, a discovery is what those familiar with the area consider a discovery at the time the first well is completed.

These definitions are vague but they are generally followed, no matter what efforts are taken to show that the words "wildcat" and "discovery" mean something more definite.

During the past few years, statistical organizations have become much more conscious of discoveries than they formerly were, so that many discoveries are now noted that would have been ignored as little as 10 years ago. Thus, the apparent increase in the number of discoveries made in 1943 (p. 115) may easily be misleading.

If a single area, Illinois, is taken as an example, we find that the State Geological Survey has kept a much more careful record of activity since 1937 than prior to that date. From January 1, 1937, to the present time, there have been 176 pools found, of which three have been abandoned. However, in these pools there are 378 producing zones, so that there have been at least 378 "discoveries" in Illinois during the past 6 1/2 years. However, there are six "consolidated" pools and probably many others have been combined without being called "consolidated." Allowing for multiple sands, it is a safe assumption that there have been almost 500 "discoveries in the Illinois basin play and that these 500 discoveries have narrowed down to 176 pools.

Of these, 37 are one-well pools and 41 more have from two to five wells each. Fifty-six more range from 6 to 25 wells, and three have been abandoned, making a total of 137 small pools. Of the remaining 39, 18 have from 51 to 100 wells and 21 have more than 100. Thus, of about 500 "discoveries," 21 have developed into sizable oil fields, with two, Salem and Louden, ranking as major fields. There are 18 more good-sized pools and the remaining 441 resulted either in small pools or in duplications.

This is a fair yardstick to apply to the "more discoveries than ever" record of 1943.

COMPLETIONS IN ALL FIELDS . . .

(Week ended October 2, 1943)

	Oil	Gas	Dry	Total	Footage	Total Comp. to date 1943	Total Comp. to date 1942
N. Y., Penna., W. Va.	47	18	5	70	133,187	2,574	2,578
Ohio	2	5	8	15	44,394	677	848
Indiana	5	1	2	8	12,257	171	248
Kentucky	6	2	6	14	31,344	317	154
Illinois	14	0	19	33	93,167	1,307	1,307
Michigan	4	2	10	16	38,864	447	534
Kansas	19	1	21	41	146,943	1,235	1,181
Nebraska	0	0	1	1	3,840	24	29
Missouri, Iowa	0	0	0	0	0	12	10
Oklahoma	12	4	15	31	89,149	906	810
Texas:							
North Central Texas	21	0	15	36	98,082	1,082	858
West Texas	21	0	1	22	95,904	853	1,089
Texas Panhandle	0	0	0	0	0	133	280
Eastern Texas	2	1	2	5	33,238	216	302
Texas Gulf Coast	4	0	4	8	58,071	340	550
Southwest Texas	7	1	7	15	69,690	694	814
Total Texas	55	2	28	86	354,985	3,118	3,873
North Louisiana	1	3	2	6	25,972	232	358
Louisiana Gulf Coast	2	0	2	4	33,044	289	376
Total Louisiana	3	3	4	10	59,016	521	734
Arkansas	1	0	1	2	13,825	182	135
Mississippi and Southeast	1	0	1	2	7,094	64	46
Montana	3	1	2	6	16,447	188	151
Wyoming	1	0	2	3	14,100	104	79
Colorado, Utah	0	0	0	0	0	18	17
New Mexico	2	0	1	3	5,345	167	183
California	19	0	5	24	76,908	982	554
Total United States	194	38	132	365	1,140,845	12,972	13,572
Total previous week	225	45	124	394			
Week ending Oct. 3, 1942	172	33	120	325			

Recent Developments in the Wimberly Pool, Jones County, Texas

by Harry F. Simons

THE Wimberly pool in southern Jones County, Texas, is the outstanding pool in the West Central Texas area at the present time and it also is something of a national example in material and manpower conservation while increasing the oil supply.

The principal feature as far as material conservation is concerned is the wide-scale application of dual completions in order that the oil from two horizons can be simultaneously produced through one well bore. With a single string of casing to the producing zone and single string of tubing, the wells so completed produce the allowable production from each of the two zones, 30 bbl. per day from each zone. The only additional equipment required is a control-head packer between the tubing and casing to separate the two zones and a side-door choke in the tubing, which together amount to practically nil in the way of critical material. The well heads are as simple as a single-zone completion, the only difference being that the annular space is not closed off in the customary manner but both the tubing and casing are connected to flow lines to the tank battery.

Dual completions are not particularly extraordinary at the present time, the idea having been introduced over 5 years ago, but never widely applied until the material shortage developed. While this technique would have been developed in the natural economic tempo, the material shortage brought on by the war has hastened its acceptance and application in numerous instances.

Manpower Conservation

The manpower conservation involves not only the reduction in operating and supervisory personnel but it also includes an outlining of the work to permit scheduling of jobs for drilling machinery and servicing equipment and crews. The high point was reached recently when an agreement was made by eight operators with one drilling contractor to deepen 16 producing wells approximately 200 ft. each and dually complete them.

The contractor will use one cable-tool machine, moving immediately to a new well as soon as a job is completed. This is rather a sharp contrast to the usual procedure of each producer hiring a contractor, the field enjoying a flurry of work, and then a layoff for contractors, equipment and crews. The order in which the wells will be deepened was determined by a study of the structure so that there will be minimum of drainage across property lines. In other words, the location being drained the most will be drilled first, and so on.

Those participating in the program are Butler & Horne Drilling Co., W. D. Brookover, R. L. Foree, Clark & Cowden, Bailey Balken, E. L. Wilson, North American Oil Consolidated and Wheelock & Collins. The contractor is Fred H. Kiel, Wichita Falls, Tex.

The field is not operated under any formal unitization agreement or organization plan, but for the most part the work is carried out under an informal arrangement whereby one man supervises most of the drilling and completion of the wells and the operation of some of the producing wells. This is done for a flat fee per well and by mutual agreement.

The practical results are the same as though the field were operated by one superintendent and the owners of the properties benefit by the knowledge of the problems at Wimberly acquired by this one man. A standard procedure for dually completing the wells and equipping them was thus possible. Instead of each company superintendent being present during the drilling and completion of the wells owned by his company, which would often mean from six to eight men in individual cars, one man takes care of this work. Superintendents for the various operators drop by occasionally when they are in the neighborhood to familiarize themselves with the operation. Roustabout gangs are reduced to a minimum and instead of suffering a rush of work followed by a layoff, they work almost continuously.

Another part of such an arrangement is the reduction in the number of special tools required in the field. This is illustrated by the equipment for running and pulling bottom-hole chokes and taking bottom-hole pres-

DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 2 crude oil	Distillate, allied products	Oct. PAW quota all oils	Sept. 25 crude oil
Arkansas	76,600	4,000	81,700	76,285
California	773,400	46,000	832,000	770,150
Colorado	7,150	.....	7,000	7,520
Eastern fields	75,200	6,000	87,200	76,450
Illinois	215,500	11,500	219,500	217,500
Indiana	14,450	.....	13,800	14,950
Kansas	272,250	4,900	300,000	296,150
Kentucky	24,720	2,200	26,600	27,675
Louisiana	360,000	27,000	375,700	359,985
North Louisiana	81,500	.....	.....	81,485
Louisiana Gulf Coast	278,500	.....	.....	278,500
Michigan	56,400	100	59,100	59,100
Mississippi	49,000	.....	50,000	48,925
Montana	22,560	300	23,400	22,180
Nebraska	1,800	.....	1,800	1,800
New Mexico	109,000	5,400	116,600	109,375
Oklahoma	325,800	27,000	345,700	325,250
Texas	1,838,150	116,000	1,999,000	1,838,150
East Texas	380,000	.....	.....	380,000
West Texas	333,500	.....	.....	333,500
North Central Texas	140,600	.....	.....	140,600
East Central Texas	131,200	.....	.....	131,200
Texas Panhandle	104,000	.....	.....	104,000
Texas Gulf Coast	654,800	.....	.....	654,800
Southwest Texas	94,050	.....	.....	94,050
Wyoming	102,975	2,000	99,600	104,350
Total United States	4,324,955	252,400	4,638,700	4,355,795

Total production January 1-October 2, 1943 ..... 1,106,329,300 bbl.
Same period last year ..... 1,069,441,920 bbl.

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*U. S. Patent Nos. 2,131,374, 2,209,752, 2,209,753, 2,209,754

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COMPLETE RANGE OF SIZES AND THICKNESSES IN BLOCKS AND PIPE COVERINGS

sures. One machine for the field suffices for this work and it is kept rather busy.

The keystone of the program at Wimberly is a cable-tool and production man, Edgar Davis, Butler & Horne Drilling Co. superintendent, who could be described as the "boss of the oilfield" as far as Wimberly is concerned. He knows where all the needed items of equipment and service can be obtained in and around the field, works out the details which are holding up any part of the operation immediately but depends on his crews for carrying out the routine. For instance, instead of sitting around and watching the perforating of the casing, he delivers an electric log with the zones to be perforated and the number of shots to be used to the driller and the crew of the gun-perforator truck and then goes to a job demanding personal supervision.

He has been in the cable-tool drilling business since 1918, starting as a tool dresser at 16 years of age at Ranger, Tex. Most of the operators sharing in the arrangement are friends of long standing and some are ex-employers.

The program for dually completing the wells worked out by Mr. Davis includes the drilling to total depth in the lowermost producing zone, running casing (or a liner in case the well is a deepening job) to the total depth, perforating both zones, running of tubing with a packer and choke body located between the perforating zones, displacing the mud with water and the water with oil, acidizing the lower zone and then the upper, and then flowing both zones until clean. The accompanying table shows the details on part of the wells completed in two zones at Wimberly to date. So far there have been 10 dual completions and several more are waiting to be completed and others are drilling.

The Wimberly field can also be classified as a little unusual from the geologic angle. The part of the field being exploited by the dual completions is over an anticline approximately 1½ miles long and wide with the major axis running roughly northeast and southwest and with a closure of approximately 170 ft. On the southeast flank of this structure a stratigraphic trap causes the Flippen lime to be productive. On the structure the zones which are productive of oil are the Hope section (called upper Hope by some and lower Hope by others) at 2,200-70 ft., the Brookover, or lower Hope, at 2,300-40 ft., and the Gunsight at 2,360-2,550 ft. Depths are for wells on top of the structure. All of the zones are cavernous limestones associated with reefs. The Gunsight and the Brookover are the two zones being produced from the dually completed wells.

Strangely enough, the deeper zone was not discovered as a result of the recent exposition of the thesis that the best place to look for oil was under existing fields. Instead, the deepest pay was the discovery zone in the field (the pool was opened in 1941) but the Gunsight pay was not tested on top of the structure until the completion of Butler & Horne 5-A Wimberly as a dual-zone pro-

(Continued on page 107)

Map of the Wimberly pool, Jones County, Texas

TABLE I—WIMBERLY DUAL COMPLETIONS

Company and well—	Date comp.	Press., flowing (lb./sq. in.) Tubing	Casing	Choke (in.)	Acid (gal.)	Perforations—Depth	No.	Packer	7-in. casing set (ft.)	2-in. tubing set (ft.)	T.D. (ft.)	Prod. bbl./hr.	Gravity °A.P.I.	Gas/oil
Butler & Horne		...	210	¼	3,000	2,310-2,334	20	2,330	*2,402	2,460	2,475	27.81	46	350/1
5 "A" Wimberly	8-12-43	285		17/32	1,000	2,378-2,402	60	....	....	....	....	51.75	44	400/1
Butler & Horne			110	¼	3,000	2,282-2,310	25	2,335	†2,458	2,400	2,509	28.91	40	300/1
2 Church	8-23-43	210		¾	1,000	2,458-2,508	†	....	....	....	....	32.25	46	200/1
E. L. Wilson		...	200	¼	3,000	2,345-2,375	35	2,395	2,525	2,509	2,525	22.10	44	150/1
4 Mashburn	8-23-43	210		¼	1,000	2,415-2,440	25	....	....	....	....	28.78	46	200/1
						2,475-2,490	20							
Maracaibo Oil Expl.			200	¾	1,000	2,356-2,384	40	2,395	†2,428	2,500	2,508	50.00	44	220/1
Corp. 2 Church	9-1-43	280		¾	1,000	2,445-2,500	35	....	....	....	....	50.00	44	400/1
W. D. Brookover		...	220	½	1,000	2,300-2,330	40	2,348	2,625	2,535	2,646	64.87	43	300/1
3 Church	9-6-43	200		¾	2,000	2,360-2,505	40	....	....	....	....	67.18	44	300/1
E. L. Wilson		...	200	¾	1,300	2,395-2,415	30	2,443	2,580	2,535	2,589	75.00	44	200/1
5 Mashburn	9-6-43	280		¾	700	2,473-2,533	40	....	....	....	....	75.00	46	400/1
North Am. Oil Cons.				¾	....	2,285-2,345						94.00		
2 Mashburn	9-23-43			¾	....	2,382-2,450						68.00		
Harry Hines					2,000	2,430-2,445						44.00		
4 Wimberly	9-23-43				1,000	2,510-2,600						45.00		
Maracaibo						2,406-2,415	10					50.00		
1 McCoy	9-15-43			¾	500	2,430-2,437	10	2,460				25.00		
				¾	1,500	2,520-2,530								
Maracaibo						2,294-2,330	35							
1 Church	9-25-43					2,380-2,392	15		§2,423		2,438			
						2,423-2,438								

*7-in. at 2,402 ft. with 79 ft. of 5-in. liner on bottom. †Lower pay not cased. ‡94 ft. of 5-in. liner. §5½-in. liner to 2,423 ft., open hole 2,423-38 ft. Data for first 6 wells from Railroad Commission reports. Others from scout reports.

OKLAHOMA

Okfuskee County Well May Open Cromwell Sand Pool

OKFUSKEE County was again a center of interest when Devonian Oil Co. and Gulf Oil Corp. had promises of a new pool at their 1 Curry, SE NW SE 2-12n-8e. The location is northeast of the town of Boley and north of the Midco Oil Corp.'s Northeast Dill pool. The Curry well, in a core at 3,580-90 ft., recovered 7½ ft., of which the upper 4 ft. was a limy saturated sand. The lower portion was less saturated. At last report the total depth was 3,592 ft. The sand was tentatively correlated with the Cromwell.

OKLAHOMA WILDCAT COMPLETIONS

Garvin County: Ohio Oil Co. 1 Burns, SE NE SW 17-3n-2e, flowed 129,000,000 cu. ft. gas, Pennsylvania sand 2,886 ft., T.D. 4,330 ft.

Jackson County: Jordan Pet. 1 Sumrow, SE NE 17-1n-20w, dry, T.D. 3,175 ft., Arbuckle 3,040 ft.

Marshall County: Magnolia Pet. 1 Beard, SE SE NW 7-7s-6e, dry, T.D. 2,010 ft.

Okfuskee County: T. N. Law 1 Stanley Palmer, NE SE NE 23-10n-9e, dry, T.D. 3,316 ft., Bartlesville 2,032 ft., Cromwell 3,312 ft.

Osage County: Peters Pet. No. 1, NE NE NE 11-22n-11e, dry, T.D. 2,148 ft., Bartlesville 1,623 ft., show oil, Arbuckle 2,144 ft. with water.

Pawnee County: Wolf Creek Oil 1 Morris, SE SE SW 28-22n-5e, dry, T.D. 3,235 ft., Bartlesville 3,209 ft.

Payne County, NW of Ramsey: Mid-Continent 1 Jones, SW NE NE 12-18n-1e, dry, T.D. 5,016 ft., Hunton 4,806 ft., Wilcox 4,997 ft.

T. N. Berry 1 Shaw, SE SE NW 4-18n-4w, dry, T.D., 4,202 ft., Viola 4,058 ft., Wilcox 4,118 ft., second Wilcox 4,148 ft., east of small gas well.

OHIO, KENTUCKY

New Clinton Gas Area Found in Hocking County

ZANESVILLE, Ohio.—A wildcat gaging 824,0000 cu. ft. was completed by Ohio Fuel Co. in Section 8, Ward Township, Hocking County, on the Sunday Creek property. The Clinton was found at 3,570 ft. and was drilled to 3,580 ft. The sand in this area is approximately 40 ft. thick, and the well will be drilled through the sand later.

The Wheeling Oriskany pool was extended ½ mile northeast by the Ohio Fuel 1 Forney completion in Section 14, Wheeling Township. The well gaged 1,200,000 cu. ft. at 3,259-67 ft. and rocked to 1,114 lb.

OHIO WILDCAT COMPLETIONS

Hocking County, Ward Township: Ohio Fuel 231 S.C.C. Co., Sec. 8, Clinton 3,570-80 ft., 824,000 cu. ft., T.D. 3,580 ft.

Morgan County, Union Township: Wittmer 1 Perry Van Horn, Sec. 16, Clinton 4,019-36 ft., dry, T.D. 4,122 ft.

WESTERN KENTUCKY

OWENSBORO, Ky.—Henderson County led in field results in Western Kentucky with three new producing wells averaging about 170 bbl. to the well in initial output. Of four wildcat completions in the district three were dry. The new pool opener was completed in Union County in Waltersburg sand by M. E. Davis on a city property lease in the Uniontown area.

WESTERN KENTUCKY WILDCAT COMPLETIONS

Union County: M. E. Davis 1 City Property, 60 bbl., Waltersburg sand at 1,703-28 ft. T.D.

Henderson County: Sohio 1 Otha Royster, 2 mi. W of Robards, dry at 2,744 ft.,

Daviess County: Shaw Kerns Syndicate 1 Breck Bates, ½ mi. E of Panther, dry at 2,040 ft., Glen Dean, 1,442 ft., Ste. Genevieve 1,885 ft.

Menard 1,701 ft., Barlow 2,224 ft., Ste. Genevieve 2,491 ft.

McLean County: Kingwood and Frontier 1 Barrett, 3 mi. W of Sacramento, dry at 2,000 ft.

INDIANA

EVANSVILLE, Ind.—A 216-bbl. well on Continental Oil Co.'s big property in the Griffin pool in Gibson County was the best well of the week in Indiana. The well is No. 64 Bozeman Land, NW SW SW 24-3s-14w, producing from Waltersburg sand at 2,082-2,100 ft. It was not shot. Superior Oil completed a 150-bbl. well, No. 1 Elmer Thompson, NW SW NE, 25-2s-12w, Gibson County.

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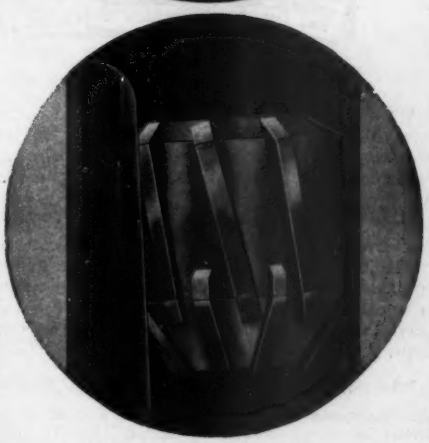

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N. CENTRAL TEXAS

New Ellenburger Field in Prospect in Archer County

WICHITA FALLS, Tex.—Prospects for opening a new Ellenburger producing field in Archer County, 4 miles southwest of Holliday, were bright at McCarthy & Coleman 1 W. H. Taylor, 330 ft. from north and east lines of Lot 13, Block 17, A.T.N. C.L. subdivision, which had Ellenburger dolomite showing oil from 4,937-70 ft., and was bottomed at 4,973 ft. The well topped Barnett shale at 4,804 ft., Mississippi lime at 4,900 ft., with detrital zone at 4,920-37 ft. It cemented 5½-in. casing at 4,940 ft., and was preparing to drill in.

Clay County.—The Stephens-Buffalo Springs Mississippi lime pool of southern Clay County was extended to the west by Continental Oil et al 2 T. J. Stephens which flowed 506 bbl. in 13 hours through 21 perforations in casing at 6,020-27 ft., opposite Mississippi lime. The company has staked a south offset to the discovery, its 1 R. W. Mayfield, 330 ft. from the north line and 1,546 ft. from the east line of a 149.9-acre tract in G. W. Stipps Survey. Short south extension for the Strawn sand producing area of the Joy pool was effected by Shell Oil Co., Inc. 1 G. W. Scaling, Lot 15, H. Williams Survey, which had sand showing oil from 3,969-4,019 ft., total depth, and cemented 4½-in. casing at 3,966 ft. to test.

Montague County.—Continental Oil Co. 1 J. G. Spencer, 330 ft. from south and west lines of E. Green Survey, 4 miles north of St. Jo, had sand showing oil from 2,754-61 ft. and was preparing to take drill-stem test. Lion Oil Refining Co. 1 Nocona Freeman, W. R. Freeman Survey, 6 miles south of Forestburg, topped Simpson at 8,083 ft. and was drilling in dry lime at 8,215 ft.

Young County.—Anderson-Prichard Oil Corp. 1 H. C. Meyers et al, G. W. Walsh Survey, 1½ miles northwest of Murray, reported a good show of oil in top of Caddo at 3,663 ft. but was drilling ahead on 5,000-ft. contract.

WEST CENTRAL TEXAS

ABILENE, Tex. — Anzac Oil and D. R. Semmes 1 J. M. Hinds, John H. Barkley Survey, ¼ mile northeast of the old Overall pool, 6 miles south of Coleman, Coleman County, was showing for an estimated 25 bbl. well from 4 ft. of sand pay topped at 2,090 ft. A brisk leasing play has developed in Coleman County during the past few weeks, most of the acreage being taken in the west part of the county. In the old Hilburn field of southwestern Eastland County, Texas Mineral Land Co. 1 Hilburn, Hickman Survey, 5 miles northeast of Pioneer, first operation in the field in several years, was flowing an undetermined amount of oil from Bend lime at 3,060-3,122 ft. Many of the wells in the field have been plugged, and it is possible some of these will be reworked on the strength of the new showing. Jones County continues to hold the most interest in the district, with seven wildcat wells now drilling. Several new blocks have been taken with tests to be announced in the near future.

WILDCAT COMPLETIONS

West Central Texas

Brown County: W. H. Sloan and R. C. Crabb 1 Earl McBride, 150 ft. from S and W, Lot 11, Jesse Dickerson Sur., dry, T.D. 927 ft.

North Texas

Archer County: R. L. Bennett 1 J. S. Veasey, 660 ft. from N and W, S 225 ac., Sec. 7, B.B.B.&C. Ry. Sur., dry, T.D. 1,350 ft.

Baylor County: Jack L. Story 1 W. H. Portwood, 150 ft. from S, 300 ft. from W, Sec. 3138, T.E.&L. Sur., dry, T.D. 1,480 ft.

Clay County: Continental Oil 1 W. H. Hilburn, 1,240 ft. from N, 779 ft. from E, E. W. East Sur., 1 mi. NE Shannon, Mississippi lime 6,171 ft., Ellenburger 6,190 ft., S.S.O. 6,190-6,210 ft., dry, T.D. 6,515 ft.

Montague County: C. E. Rodgers and A. R. Dillard 1 Edna Neeld, 642 ft. from NW, 400 ft. from SW, Blk. 90, Panola County School Land, 1½ mi. S Fruitland, Caddo 5,876 ft., Marble Falls 6,084 ft., Simpson 6,818 ft., Simpson dolomite 7,164 ft., S.S.O. 7,164-68 ft., dry, T.D. 7,876 ft.

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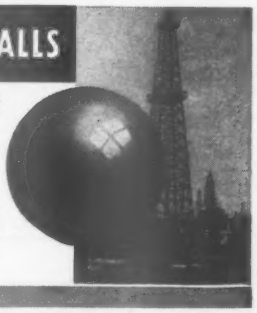

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PERMIAN BASIN

Gaines County Wildcat Has Big Gas Flow in Yates

MIDLAND, Tex.—Honolulu Oil Co. 1 Elsie Buck Homann, SE SE Section 96, Block G, W.T. Ry. Co. Survey, 8 miles east of the Seminole pool, was flowing an estimated 20,000,000 cu. ft. gas from the Yates formation topped at 3,320 ft. With an elevation of 3,250 ft., the Honolulu test was running approximately 220 ft. higher on top of the Yates than Gulf 1 Kottwitz, NW NW Section 92, 4¾ miles north, which was dry at total depth 6,070 ft. Although it is not uncommon for wells in this part of the basin to have a show of gas in the top of the Yates, a flow of this magnitude indicates very favorable structural position, and a new trend of play is developing paralleling the Wasson-Seminole-Means pools, through the Texas Co. 1 Mabee discovery in southeast Andrews County. The Honolulu prospect is drilling ahead, and will set casing through the Yates area. Sixteen miles south by east of the Honolulu well, Texas Co. 1 Parmer County School Land, northwest corner League 317, which topped the Yates at 3,355 ft. with elevation of 3,120 ft., had entered the gray lime and was drilling at 4,892 ft.

Andrews County: Texas Co. 1 John Mabee, NE SW Section 37, Block 40, G.&M.M.B.&A. Survey was bottomed at 4,770 ft. in gray dolomite, and was running 2-in. tubing to test. The well had shows of oil in top of the San Andres lime at 4,630 ft., with good saturation and porosity in cores to total depth.

Cochran County: Sunray Oil Co. 1 D. C. Reed, SE SW Section 37, Harrison & Brown Survey, southwest part of the county, ran Schlumberger survey and showed porosity and was running and cementing 5½-in. casing. The wildcat had shows of oil in cores at 5,074 ft. to total depth 5,168 ft., with sulfur odor in the bottom cores.

Mitchell County: M. L. Richards 1 Erwin, old well being deepened to the Vincent pool pay, reported saturation and porosity from 3,840-87 ft., and was preparing to run 7-in. casing to 3,820 ft. to shut off water above that depth. The wildcat is 4½ miles east of the Vincent discovery.

Ector County: Deepening to the Ellenburger was announced for Stanolind Oil & Gas 1-B W. F. Cowden, SE SW Section 12, Block 44-1n, T.&P. Ry. Survey, abandoned in February 1941 at 7,000 ft. The well lies 6 miles southeast of nearest producer in the Embar-Ellenburger pool, and 1 mile west of nearest producer from the Holt pay, Clear Fork lime.

SOUTHEAST NEW MEXICO WILDCAT COMPLETIONS

Eddy County: Johnson & Wells 1 Wells, NW SE Sec. 17-20s-28e, dry, T.D. 991 ft. lime.

CANADIAN FIELDS

Devonian Production Found In Ram River Test

CHATHAM, Ont. — In the Ram River - Clearwater area in the northern Alberta foothills, Ram River Oils 2, LSD 8, 1-37-11w5, bottoming in the Devonian limestone at 4,350 ft., has developed heavy pressure when shut in, the accumulated pressure blowing out the 600-lb. pressure gage. The well blew wide open more than 2 hours until a 2,000-lb. pressure gage could be installed. The well has an indicated production of 75 bbl. of light crude daily, and the gas flow seems to be increasing. Location is being made for Ram River 3, which will be drilled with a larger hole for commercial production.

Jumping Pound.—On the Jumping Pound structure west of Calgary, Shell Exploration-Norman 1 deep test, LSD 5, 22-24-5w5, the deepest well in Canada, has a fishing job after drilling to 11,694 ft. The test got the Madison limestone at 11,588 ft. Caving started from a point 400 ft. from the bottom of the hole. Efforts are being made to clear the hole and resume drilling, which should be carried to around 12,000 ft. before a production test is made.

Turner Valley allowables.—New allowables issued for a number of Turner Valley crude producers show that British Dominion 5, LSD 5, 17-21-3w5, most northerly producer in the field, has the largest allowable, 800 bbl. daily. Another large producer is Imperial-Hudson's Bay 15, LSD 1, 8-18-2w5, the outpost producer to the southwest, with 400 bbl. daily. Home Oil 2, in the original North Turner Valley, which has been producing for several years, is still one of the major crude wells, with 360 bbl. a day. Among new completions, Foothills Oil & Gas 15, LSD 7, 4-21-3w5, finished at 8,569 ft. with Madison at 7,343 ft., is allowed 350 bbl. daily.

Vermilion.—In the Vermilion field, eastern Alberta, six outfits are steadily at work, and shipments of cleaned oil from the Vermilion refinery will run around 15,000 bbl. for September. Cannar Oils, sponsored by the Canadian National Railways, has completed 16 wells, with two more drilling. The company has eight wells on steady production. Some of its recent completions have been good wells, Cannar 8, SW¼ LSD 8, 30-50-5w4, starting at 36 bbl daily; and Cannar 12, same LSD, running 78 bbl. The company is experimenting with central pumping, Nos. 2 and 6 being operated from one engine by means of cables. A possible extension of the field to the south is indicated by Rancho 1, LSD 14, 34-47-6w4, drilled by M. W. Williamson, which is coring what looks like a good sand. A number of wells have finished drilling, but are not yet in production.

Lake Erie well. — In southwestern Ontario, West Petroleum 1, located in the bed of Lake Erie opposite the Romney end of the old Tilbury gas field, has spudded, and is below 400 ft. Location is 5,950 ft. off shore. The drilling outfit is set up on a substantial crib work constructed in 34 ft. of water. Test is expected to reach the potential producing horizon of the Guelph-Niagara limestone, between 1,300 and 1,450 ft., inside about 3 weeks. Earlier lake wells were drilled not more than 1,000 ft. off shore and got fair production, but the present test is expected to tap the gas sands at a point where heavy volume and pressure can be looked for. Stover & Rawlings of Chatham have the drilling contract.

MICHIGAN

Allowables Reduced in Flush Fields

SAGINAW, Mich. — A half - dozen more wildcat tests resulted in dry holes last week as Michigan operators completed 16 drilling operations to get 4 oil producers, 2 natural-gas wells and a total of 10 dry holes. Meanwhile proration was ordered for two more Michigan fields and schedules for four others were revised.

None of the new oil wells was exceptional, production ranging from 5 bbl. a day for one well in Allegan County to 144 bbl. pinched from a new Fork-Mecosta well.

A limitation of 252½ bbl. has been placed on each 40-acre unit in the Goodwell field of Newaygo County and the Rose Lake field in Osceola County. All limitations were removed from the Winterfield-Clare field, where the limit had been 150 bbl. per 20-acre unit and 262½ bbl. on 40-acre tracts. The present 262½-bbl. limit on 40-acre units in the Evart field of Osceola, the Fork-Mecosta and Prosper-Missaukee fields was cut to 150 bbl. a day. Wells in Evart and Prosper have not been producing at their allowable maximums. Winterfield has been unable to make its limit. Expected new wells in the Fork field should make up production losses resulting from the new limitation in that area.

MICHIGAN WILDCAT COMPLETIONS

Allegan County, Monterey Township: Muskegon Development Co. 1 Wilbur M. Arndt, N½ SW SW 20-3n-13w, dry in Traverse limestone, T.D. 1,770 ft.

Otsego Township: Robert B. Patrick 1 Hare, SE NE NW 20-1n-12w, dry in Traverse limestone, T.D. 1,523 ft.

Osceola County, Rose Lake Township: Rowmor Corp. et al 1 Grace Sanford, S½ SE NE 31-19n-9w, dry, T.D. 3,827 ft.

Ottawa County, Robinson Township: S. L. McCall 1 Timmerman, NW NE NE 26-7n-15w, dry hole, T.D. 1,701 ft.

Roscommon County, Backus Township: Sun Oil Co. A-1 State-Backus, N½ NW SE 20-22n-3w, dry in Dundee, T.D. 3,858 ft.

Van Buren County, Bangor Township: Harris Oil Co. 1 Carl Jablonsky, SW SE SW 13-2s-16w, dry in Traverse limestone, T.D. 1,363 ft.

TEXAS GULF COAST

Prospecting in Coastal Area Declining

HOUSTON, Tex.—New work in the Texas Upper Gulf Coast area dropped to a minimum during the week just ended. Only three new tests were reported in the district. One new location was a semi-wildcat east of the Stowell field and southwest of McCarthy's 1 McFaddin, prospective discovery in the East Stowell area, Jefferson County.- This was Northern Ordnance, Inc. 1 Minnie Hinkle, on 160-acre lease in Section 156, H.&T.C. Survey A-657, 660 ft. from north and east lines of southwest quarter of the section, and contracted to 9,600 ft. Shell Oil Co., Inc. located 2 James Robinson Unit No. 2 at Mercy field, San Jacinto County, and Magnolia and Abercrombie spotted 1 Arthur W. Wilson at Old Ocean, Matagorda County, to round out the week's new development program.

Besides these three tests, other development is scheduled on the east end of the Wilcox trend in Texas and leasing has shown increase in the area during the past few months.

TEXAS GULF COAST WILDCAT COMPLETIONS

Liberty County: W. W. West 1 W. W. West fee et al, southeast flank Davis Hill dome, dry at 8,421 ft.

Wimberly Pool

(Continued from page 100)

ducer. Between the discovery of oil in the Gunsight and its widespread development by the dual-completion method, the Flippen lime on the edge of the structure and the Hope and Brookover limes on the structure were extensively developed.

The total allowable of the pool has gone up approximately 270 bbl. per day since the start of the dual-zone program. Wells are limited to 30 bbl. per day per horizon. Incidentally, the field as a whole has practically no underage and produces all of its allotted oil each month, a fair gage of a field's ability to produce at this time.

Two-zone production is not uncommon in fields in the West Central Texas area but formerly twin wells were used for exploitation of such fields. With the pattern set at Wimberly, future development of two-pay pools will probably include dual-zone completions as part of the program.

ROCKY MOUNTAIN

Old Rangely Well Opened After 10-Year Shutdown

DENVER, Colo. — The opening up and putting on production of the California Co. 1 Raven, C NW SE 30-2n-102w, Rangely field, Colorado, 10 years after its completion as a discovery, marks the beginning of a new era in one of the oldest fields in the Rocky Mountain area. The Rangely structure, shaped very much like an oyster shell, lies in the northwest corner of Rio Blanco County, 10 miles east of the Utah boundary. It is an anticlinal dome 12 miles long, on the north flank of the Uinta Mountains, with the axis trending northwest to southeast, and surrounded by an escarpment of lower Mesa Verde sandstone. The surface is Mancos shale and it has a known closure of 1,200 ft.

The field was discovered in 1902 when a well in the Mancos shale came in as a producer at 480 ft. The oil had a gravity of 52° A.P.I. scale, and a high gasoline content. The field rocked along, however, until it had built up a total production of only 14,000 bbl. in 1919 from the shallow wells. Then the Standard Oil Co. of California drilled a deep test in 21-2n-102, which was abandoned in the Morrison at 3,825 ft. In 1925 the old Midwest Refining Co. drilled a test in Section 30 which was completed in the Dakota at 2,954-58 ft. for 50,000,000 cu. ft. of gas a day. The Texas Co., in the same year, completed its 1 Emerald in Section 30 for 74,000,000 cu. ft. in the Dakota. The well blew wild for several months, the gas was exhausted, water came in and it was abandoned. The Midwest and Texas Co. each drilled a well in Sections 30 and 31, both showing water in the Dakota, but were completed as small gassers in the Morrison. Tide Water Associated Oil Co. next drilled in 24-2n-103, and found the Sundance water bearing at 4,052 ft.

These tests apparently sealed the fate of the structure except for the nominal shallow production, and the Texas and Midwest companies disposed of their leases. The California Co. subsequently became interested and acquired the Midwest and other leases and in 1931 started 1 Raven, the deep test. In 1933 it reached a depth of 7,173 ft. and plugged back to 6,335 ft. to test a show in the Weber sand of Pennsylvanian age, which is the equivalent of the Tensleep in Wyoming. The 9-in. was set at 5,657 ft., exposing 668 ft. of sand, shale and lime in alternating streaks, the sand lenses being saturated. After shooting and experimenting with the well for some time it was called a completion, averaging about 200 bbl. daily of 33-gravity crude on a short test. It was then shut in and remained undisturbed for 10 years until a few weeks ago when plans were completed for opening it up and testing it. In these tests it showed 227 bbl. in 24 hours through a 34/64-in. choke on the tubing, with a pressure of 120 to 150 lb. on the tubing and 1,000 lb. on the casing, the oil testing 34.9 gravity. The well is now on regular production, and the oil is being moved by truck to Salt Lake City.

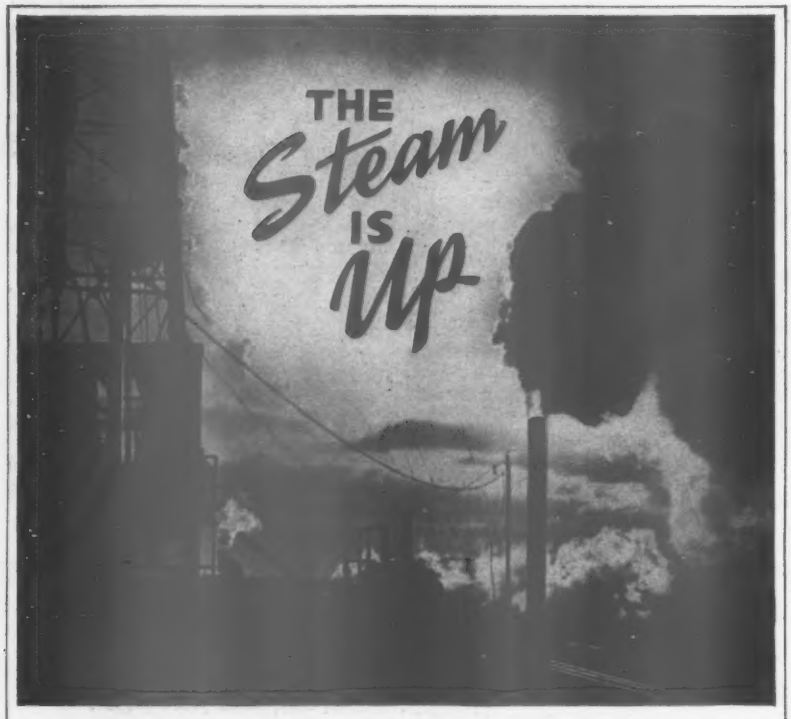
In 1931, when the deep test was started, shallow production had dropped to 10,000 bbl. for the entire year. However, in the last five years development of the shallow horizon, principally by the Equity and Utah Southern Oil companies, and the Raven Oil & Refining Co., has shown some interesting results. Prospecting has been along calcite seams looking for fractured zones in the Mancos shale. This work has been quite successful, and in 1939 production jumped to 132,021 bbl., from 26,084 bbl. in the previous year. In 1942 the shallow output was 307,084 bbl. and at present it is running around 1,000 bbl. a day, exclusive of the deep sand.

WYOMING WILDCAT COMPLETIONS

Belle Springs, Carbon County: Sinclair-Wyoming Oil Co. 1 Unit, NW NE SE 32-24n-88w, T.D. 4,351 ft., dry in Madison. Tops: Dakota, 1,480; Tensleep, 3,406.

MONTANA WILDCAT COMPLETIONS

East Shelby, Toole County: Northern Ordnance, Inc. 1-D State, NW NW 30-32n-



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2e, T.D. 1,647 ft., top of Madison 1,630 ft., dry.

Teton Block, Teton County: Northern Ordnance, Inc. 1 Hargrave, NE SE 27-25n-7w, T.D. 4,278 ft., Sunburst sand 3,875-3,900, top of Madison 4,130 ft., show of oil and sulfur water, dry.

SOUTHWEST TEXAS

Willacy Pool to Be More Actively Developed

CORPUS CHRISTI, Tex. — Expansion of production, and of proposed development in the big Willamar field of Willacy County, continues one of the most important activities in the Southwest Texas area. This field, evidently one of the largest in area in the district and still unlimited, was recently extended to the north by Pan American's 1 de Rodriguez following another major extension on the south a few days earlier by Baldridge & King. The Pan American north outpost flowed 243 bbl. daily on ¼-in. choke from perforations 7,850-7,925 ft. which took in only 75 ft. of the more than 100 ft. of proven oil sand. Above the oil sand is a large gas sand section. Proposed activity in the area included Sun's 1 Perez, about 4,200 ft. south of Pan American 1 Garcia well, Circle Oil Co. 1 J. H. Cavazos, east of Baldridge & King's south extension well, Lyon & Prentiss 1 Pablo Olivares et al and 2 Pablo Olivares, south of Pan American's Garcia well. Besides these new locations Pan American is moving in rig to the No. 1 Lozano and to the 1-E Willamar Community, and Standard of Kansas drills ahead in the 1 Bucy below 3,500 ft. and in the 1 de Cavazos near 5,000 ft.

Bee County.—A new field for Bee County was brought in by Pure Oil Co. in the 1 Tom Williams, Blanconia area, extreme east corner of the county. With total depth 4,977 ft., production was from the Vicksburg, where sand was logged at 4,953-58 ft., sand and shale 4,958-64 ft. with shaley sand to bottom. Preliminary tests showed the well good for around 150 bbl. daily.

Brooks County.—Standard of Texas was testing the 1 Justo Chavana et al, wildcat 3½ miles southeast of Alta Mesa, first test being made in perforations 7,040-50 ft. The 5½-in. casing had been set at total depth 7,066 ft.

Starr County. — Final completion was made in Sun Oil Co.'s new discovery at North Sun field, 3-C Isabel Montalvo et al. It flowed at the rate of 5 bbls. per hour on 7/64-in. choke from perforations 5,105-10 ft., total depth 5,147 ft., 5½-in. casing set at total depth. This test, in Los Retachez grant, is almost ½ mile southwest of the 2-C Montalvo, 4,900 ft. sand discovery, on south flank of the field.

Jim Hogg County.—Texas Co. 1 Louis Armstrong, discovery well of a new oil field obout 7 miles southwest of Hebbronville and 3 miles southwesterly from the Yaeger field, flow 285 bbl. daily pipe line oil from Loma Novia sand at 3,247-55 ft.

Starr County.—Sun Oil Co. gaged 4 Marrs McLean, new 3,900-ft. pay discovery on southwest flank of the Lockhart field, the well flowing 47 bbl. clean oil in 20 hours through flow valves, from open hole at 3,911-14½ ft. This production is from the Yegua zone and is the deepest sand yet opened on the Lockhart structure.

LOWER GULF COAST WILDCAT COMPLETIONS

Bee County: H. E. Dirks et al 1 Geo. W. Goeree, 3 mi. W of Mineral townsite, dry at 7,113 ft.

Texas Co. 1 Bolland Bros., 2 mi. NW of Clareville, dry at 5,454 ft.

Calhoun County: Auto-Ordnance Corp. & Texon Roy. Co. 1 Wm. Manuel, 1 mi. east of Long Mott, dry at 8,511 ft.

Jim Wells County: W. L. Goldston et al 1 Reed & Lindsay, 2½ mi. SW Alice, dry at 5,400 ft.

Smith & Story, Inc. 1 Vicenta Perez, 1 mi. SE of Armagosa gas field, dry at 4,014 ft.

Nueces County: Texas Gulf Prod. Co. et al 1 W. E. Baxter et al, 5½ mi. NW of Robstown, dry at 7,525 ft.

SOUTH TEXAS

Duval County: Sun Oil Co. 1 Matilda I. Richardson, 2¼ mi. W NW of Bridwell field, dry at 4,135 ft.

Starr County: Lockhart & Davenport 2 Domingo L. Garza, discovery 1¼ mi. S SE of Lockhart field, 450,000 ft. gas, spray oil, ⅛-in. choke, T.P. 500 lb. S.I.P. 1,390 lb., perf. 4,014-17 ft., T.D. 4,086 ft., P.B.T.D. 4,020 ft. Shut in.

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EASTERN TEXAS

New Hope Field Extended To North

DALLAS, Tex. — The New Hope field, southern Franklin County, 4 miles north of Scroggins, received a ¼-mile north extension and two new locations last week. The extension, Tide Water Associated Oil Co. et al 1 G. L. Gilbert, was dually completed from the Rodessa and Travis Peak horizons. The casing was perforated opposite the Rodessa pay from 7,295-7,311 ft. and gaged 349 bbl. 42 gravity oil, and the Travis Peak pay yielded 170 bbl. 46 gravity oil. The hole is bottomed at 8,045 ft. Locations were staked northeast and southwest of the discovery for additional tests. Two miles northwest, Humble Oil & Refining 1 Solon King, W. Y. Lacy Survey, topped Woodbine at 4,140 ft., Georgetown lime at 4,744 ft., and was drilling ahead below 4,825 ft.

Van Zandt County: Superior Oil Co. 1 C. A. Groves, Van Sickle Survey, reports top of Woodbine at 4,312 ft., Georgetown lime at 5,127 ft., Paluxy sand at 6,235 ft., Glen Rose at 6,530 ft., and is drilling below 7,500 ft.

EAST TEXAS WILDCAT COMPLETIONS

Kaufman County: Sun Oil Co. 1 J. M. Rutledge, 660 ft. from NE, 2,376 ft. from SE 200-ac. tract, or 350 ft. from NE, 2,376 ft. from SE, E. Parsons Sur., 4 mi. NE of Elmo, elev. 584 ft., Pecan Gap 1,400 ft., Austin 2,165 ft., Eagleford 2,800 ft., Woodbine 3,330 ft., Georgetown 4,002 ft., Goodland 4,820 ft., Paluxy sand 4,930 ft., Glenrose 5,160 ft., Massive anhydrite 5,966-6,110 ft., Cotton Valley 7,640 ft., Smackover 10,038 ft., dry, T.D. 10,057 ft.

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LOUISIANA GULF

Deep Test Staked on Pine Prairie Dome

NEW ORLEANS, La. — Louisiana operators continue to watch with keen interest the development around the old Pine Prairie dome, and at the same time are keeping in close touch with activity in the Reddell area, Evangeline Parish. Gulf Refining Co. which is drilling one 11,000-ft. Wilcox test on the south flank at Pine Prairie, staked location for another 11,000-ft. test, this newest operation on west flank of the dome, where Hunt opened Wilcox production some weeks ago and the Texas Co. recently completed a good oil well in the same horizon. Down on southeast flank of the dome, Gulf completed a new Sparta producer, 1 Gournay-Schlicher - Thomas, flowing 253 bbl. daily on 5/32-in. choke from perforations 7,875-7,925 ft. North of west flank Wilcox production, Hunt 5-E Crowell found salt at 6,995 ft. and plugged back to deviate away from the dome, and down on the southeast flank, Hunt 4-D Crowell was going ahead below 10,087 ft. in the Wilcox with no show of oil or gas reported in this zone, having found salt water in sands encountered to this depth.

Danciger Oil & Refining Co. et al continued tests in the 1 Hattie Haas, discovery well on the Reddell prospect, but were having considerable trouble with high temperatures, several of the tests not being considered conclusive due to this fact. Bottomed at 12,206 ft., it has been testing upward, last test at 11,792-812 ft. recovering oil, mud and water. About 1¼ miles west of the Danciger et al test, Continental and Humble ran electrical log to 11,348 ft. in the 3 Pardee Lumber Co., and cored ahead at 11,436 ft. This wildcat is running considerably higher than the Danciger well due to faulting.

Vermilion Parish.—Humble Oil & Refining Co. 3 Louisiana Fur, at total depth 11,623 ft., cemented 5½-in. casing near bottom for testing. This wildcat is in the Pecan Island area where the company has two gas wells, one having been completed at

10,832-47 ft. and the other at 7,515-30 ft.

Terrebonne Parish.—Humble 4 Continental, on the Deer Island Prospect, was also preparing to run some production tests, total depth 11,300 ft., bottomed in sandy shale. It was preparing to run casing.

SOUTH LOUISIANA WILDCAT COMPLETIONS

St. Mary Parish: Atlantic Refg. Co. 2 Adeline Sugar Co., North Jeanerette area, dry at 12,041 ft.

CALIFORNIA

Extension to Helm Field Is Probable

LOS ANGELES, Calif.—General Petroleum Corp. is expected to extend the productive limits of the Helm distillate field within the next few days as the company's 4-F Noble, 5-17s-18e, has cored 90 ft. of oil sand at 7,923-8,035 ft. A few days ago the company tested the interval at 8,040-92 ft., in the bottom of the hole, and found it wet. Previously a test had been made on top of the oil sand and a good shutoff was accomplished. As the well now stands, a shutoff was effected above the pay and the bottom of the hole below the oil zone was wet and has been cemented. A string of 5¾-in. casing had been landed at 8,085 ft. prior to the above tests and this will now be perforated opposite the oil sand for production. Top of the Kreyenhagen was at 7,535 ft., top of the Domengine at 7,933 ft. and top of the Paleocene at 7,939 ft. This outpost is located north of Amerada's Wheatville Ranch property in 8-17s-18e in the southeastern end of the field and northwest of a dry hole drilled by General Petroleum in 9-17s-18e and abandoned in Cretaceous at 8,508 ft.

Fresno County.—Shell Oil Co. found the Eocene barren in 1-1 San Joaquin in 10-15s-17e and has plugged the hole back from 6,376 ft. to 4,978 ft. and landed a string of 6⅝-in. casing at 4,975 ft. This well, located northwest of the discovery well in the West Raisin City field, found a good-looking gas sand in the Miocene and will probably be able to develop commercial gas production. A formation test made several weeks ago at 4,973-5,035 ft. resulted in the well flowing at a daily rate of 22,000,000 cu. ft. and having a bottom-hole pressure of 2,200 lb.

Kings County.—Bolsa Chica Oil Co. has abandoned its well 58-19-V in the Kettleman Middle Dome field of Kings County and as soon as R. S. Lytle abandons the lone remaining well the field will have been found wanting and lacking accumulation of importance. Standard Oil Co. abandoned its 6-29-V in the Middle Dome field a few months ago and this once-promising field is passing out of the picture after having produced only 455,509 bbl. of crude oil. The field has been inactive for several years after the three completed wells died and could not be returned to production.

Madera County.—Texas Co. is working on 71-21 Gill in 21-13s-16e in an effort to develop oil production but may have to be content with commercial gas production as salt water has shown up in the oil sand. Texas has experienced outstanding success in its exploratory work in Madera County because in addition to finding a commercial gas field at Mendota the company has found what appears to be a major gas accumulation in the Firebaugh district about 10 miles northwest of Mendota. A good gas field in this section of the state will be a profitable undertaking because of the numerous gas fields found in the Sacramento delta area as well as to the north and the comparative freedom from discoveries in southern San Joaquin Valley. The Oakland-San Francisco Bay region and adjacent territory now appears to have ample gas supplies available for a number of years, but southern California, the center of the state's greatest population, has been scratching bottom for a long time.

Kern County.—Bandini Petroleum

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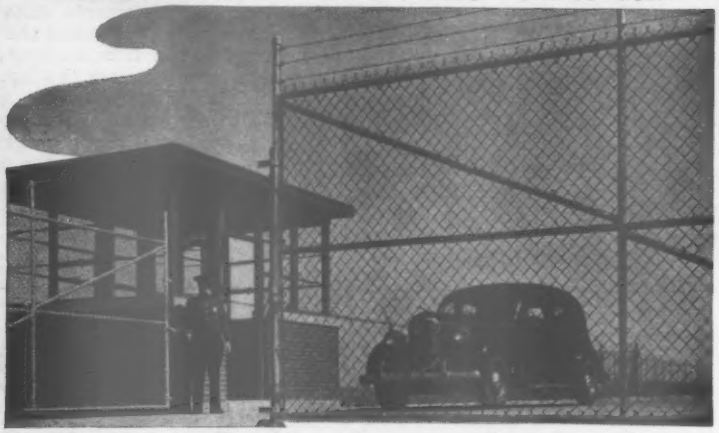

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Co., which discovered a new oil field west of the Round Mountain field a few weeks ago, appears to have found what may prove to be a primary discovery. Several days ago the discovery well began flowing and at present is building up. The real importance of this field should be determined in the near future as General Petroleum, which controls all but a small part of the probable ultimate acreage, has already started work on its initial well which is being drilled in 23-28s-28e on property leased from the Southern Pacific. This is a structural trap along a fault and production is coming from Vedder oil sands of Miocene age.

Important wells. — Prospectors are watching the Zastrow Oil Co.'s outpost in the Edison field of Kern County with much interest because this well is reported to have cored enough oil sand in the Olcese zone to make a producing well. The well in question is 38-16 Cauley in 16-20s-29e, a location or two east of Arthur Anderson 1 Cauley, a small pumper, in the same section. If the section east of Anderson's well is thickening, as is indicated by Zastrow's semiwildcat, then there is a possibility another small productive area may be found to the east.

Orange County. — The Huntington Beach field is experiencing a revival of drilling, reflecting additional development of the tidelands, principally the Jones sand of Pliocene age, and extension of drilling operations in the so-called Five Points area where production is being developed from the upper Ashton zone of Pliocene age. The Jones sand in the tideland accumulation is a factor of considerable importance even though initials of new wells have been small as royalties are high on large-capacity wells, many of them being capable of flowing upwards of 2,500 bbl. daily.

COASTAL DISTRICT

Santa Barbara County.—Union Oil Co., which has been at work for the past several months drilling a series of core holes in the Sisquoc Creek district of Santa Barbara County, is still at work. This work is being done with a light portable rig and involves a series of tests on about 45,000 acres of potentially productive land. Recent drilling by Tide Water and General Petroleum Corp. in the Zaca Creek district resulted in the finding of accumulations of very heavy viscous oil that could not be pumped economically as it required the injection of distillate or very light crude oil to permit pumping.

CALIFORNIA WILDCAT COMPLETIONS

Dixon district, Yolo County: Shell 1 Glide, 15-7n-3e, abandoned in barren gray sand, T.D. 6,696 ft., no important showings found, bottomed in siltstone.

Buelton district, Santa Barbara County: Texas 1 Petan Investment Co., 20-6n-32w, abandoned in Cretaceous shale and gray sand, T.D. 1,743 ft., no important showings logged or tested.

ILLINOIS

Pool Opener in Eastern Jefferson County

CENTRALIA, Ill. — Gulf Refining Co. opened a pool with a 494-bbl. initial producer from McClosky lime in 23-1s-4e, Jefferson County and J. H. Williams et al 1 Dalton Community opened a new productive spot in the same county in 13-2s-4e, the well having started at 517 bbl., 5 per cent cut by salt water. It is also producing from McClosky lime. Superior Oil Co. 1 Huntersicker, in 11-4n-8e, after an acid treatment in McClosky lime, flowed 100 bbl. in 20 hours but settled to a 15-bbl. pumper. It was a wildcat.

National Refining Co.'s big well in the Golden Gate pool, Wayne County, No. 1 Lawrence, SE NW SE 32-6s-9e, which started at the rate of 111 bbl. per hour, later flowed 2,125 bbl. through casing in 24 hours, then dropped off to 1,551 bbl., 1,381 bbl., 1,254 bbl., and 1,132 bbl. on successive days.

Kingwood Oil Co. completed a 220-bbl. well in J. W. Bryan, SW SW NW 35-6n-5e, South Mason pool, Effingham County. The pay was McClosky lime, 2,441 to 2,502 ft., with several breaks in the formation.

The 33 completions recorded during the week included 14 oil wells and 19 dry holes, an unusually large percentage of failures in the state in a week's time. With the exception of the above-recorded good wells the average initial production was small, running from 12 bbl. to 194 bbl.

Only four wildcat tests were started, but altogether 37 new operations were reported in the course of the week. The wildcats were Lafayette Funk and Central Oil Co. 1 Tarpley, E½ NE NW 22-2n-14w, Edwards County; Superior Oil Co. 1 Agnes Jack, SE SW SE 5-2s-14w, White County; Luttrell 1 Tonn, NE NW NW 14-6n-5e, Effingham County; E. J. Bergenthal 1 Kull, SE SE SW 15-10n-5e, Shelby County, and same operator's 1 Schief, NE NE SE 21-10n-5e, also in Shelby County.

ILLINOIS WILDCAT COMPLETIONS

Clay County: Superior 1 Huntersicker, NE SE NW 11-4n-8e, 15 bbl., McClosky lime 3,063-67 ft., acid., T.D. 3,148, P.B. to 3,075 ft. Pool opener.

Edwards County: Texas 1 Hayes, E½ SE NE 10-1n-10e, dry at 3,335 ft., Fredonia 3,265 ft., McClosky 3,269-73 ft., P.B. to 3,284 ft. and acidized at 3,345-51 ft.

Jefferson County: Gulf 1 McNail, NW SE NE 23-1s-4e, 494 bbl., McClosky lime 2,882-86 ft. and 2,890-94 ft., T.D. 2,901 ft. Pool opener.

Byers & Ellison 1-B Jeff O. & G., NE NW SW 32-3s-2e, dry at 2,564 ft.

J. H. Williams et al 1 Dalton Community, C SE SW 13-2s-4e, pumped 517 bbl., McClosky lime 3,115-19 and 3,124-28 ft., acid., T.D. 3,133 ft. Pool opener.

Pike County: Mineral Investment 2 G. S. Hyde, NE NE SW 14-5s-6w, fourth p. m., dry at 631 ft., Trenton lime top 466 ft.

Hamilton County: National Associated 1 York-Tibbs Community, NE NW NW 35-4s-7e, flowed 506 bbl. in 22½ hr., 5 per cent salt water; Aux Vases sand 3,303-13 ft., T.D. 3,314 ft.

St. Clair County: G. A. Morris 1 Munier, SE SE NW 27-1s-9w, dry at 369 ft., Weller sand 170 ft., Paint Creek 250 ft., Benoist 250 ft., shot in Weller and Benoist.

Washington County: H. S. Williams 1 Holeman, SW SE SW 3-1s-1w, dry at 1,568 ft., upper Glen Dean 1,208 ft., Cypress 1,420 ft., Paint Creek 1,496 ft., Benoist 1,524 ft., Benoist sand 1,540 ft.

White County: Great Lakes Carbon 1 Miller, SW SW NE 28-6s-10e, junked at 2,919 ft., Aux Vases sand top 2,897 ft.

William County: George Allison 1 Huck, NE NE SE 8-8s-3e, dry at 2,907 ft., upper Kincaid 1,417 ft., Cypress 2,379 ft., Paint Creek 2,430 ft., Aux Vases 2,556 ft., Fredonia 2,754 ft.

KANSAS

New Chat Pool Looms For McPherson County

TWO wildcats were standing as possible pool openers the latter part of last week. In McPherson County, Adair & Morton 1 Paden, SW SE 10-18-1w, had 1,000 ft. of oil in the hole after finding pay in the Mississippian chat at 2,750-70 ft. Location is about midway between the Crowther and North Canton pools, both producing in the chat. It is about 6

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miles southeast of the Roxbury, Henne and Lilly chat pools.

Russell County.—Cities Service 1-F Miller, SW SE NE 32-13-14w, 2½ miles west of the Russell pool at the south end, had a hole full of oil in the Arbuckle at 3,304-07 ft. While classed as a wildcat, production here establishes another connection to the four pools, Atherton, Russell, Gorham and Hall-Gurney, which are rapidly becoming one large producing area.

KANSAS WILDCAT COMPLETIONS

Barber County: Superior Oil Co. of California 1 Mitchell, NW NW SW 15-33-15w, dry, T.D. 5,462 ft., Viola 5,195 ft., Simpson 5,316 ft., Arbuckle 5,432 ft.

Graham County: Hollow Drlg. 1 Wiesner, NW NW NW 31-7-21w, dry, T.D. 3,753 ft., Lansing 3,410 ft., Arbuckle 3,733 ft.

Mid-Continent 1 Hazen, SE SE 18-8-25w, dry, T.D. 4,457 ft., Viola 4,330 ft., Simpson 4,435 ft., Arbuckle 4,444 ft.

Pawnee County: Gulf Oil Corp. 1 Nora Schockley, S½ SE SE 22-20-20w, dry, T.D. 4,623 ft., Viola 4,538 ft., Arbuckle 4,766 ft.

Phillips County: C. M. Coats 1 Murray, NW SW 16-4-18w, dry, T.D. 3,615 ft., Arbuckle 3,558 ft.

Rooks County: Shell Oil Co. 1 Howard, SW SW SW 26-10-18w, dry, T.D. 3,706 ft., Lansing 3,326 ft., Simpson 3,658 ft., Arbuckle 3,684 ft.

Russell County: Saco Oil Co. 1 Eulert, NE NE SE 33-11-15w, dry, T.D. 3,310 ft., Arbuckle 3,275 ft.

Stafford County: Gulf Oil Corp. 1 Paul Andreas, E½ NE SE 4-23-12w, dry, T.D. 3,898 ft., Viola 3,705 ft., Arbuckle 3,776 ft.

Sumner County: Magnolia 1 Rowan, NE SW SW 3-30-4w, dry, T.D. 4,545 ft., Mississippi lime 3,969 ft., Simpson 4,406 ft., Arbuckle 4,505 ft.

South Dakota Wildcat Makes Small Gasser

PIERRE, S. Dak.—A small gas well, reported at 86,000 cu. ft. per day, has been completed near Whitlock's Crossing, Potter County. The well is making about 1,500 bbl. of water with the gas, which comes from the Dakota sandstone. Wells of this character have been produced in the vicinity of Pierre, 35 miles to the south, for over 30 years. The structure on which this well was drilled was mapped some years ago by the state Geological Survey, and it is reported that confirmation of the structure by drilling has interested an eastern syndicate which is contemplating drilling a deep test. The gas well was financed by a group from Gettysburg, county seat of Potter County.

Other wells now drilling include Northern Ordnance's test in Harding County, on a southeastern extension of the Baker-Glendive anticline. This is the third well to be drilled by this company in this area, the others being near Linton, N. Dak., and Gage, Mont. The well is planned to test the Deadwood (Cambrian) sand. Two other wells are drilling, one in Aurora County east of the Missouri River and one in the southwest corner of the state in Fall River County.

LEGAL

OIL AND GAS LEASE

U. S. DEPARTMENT OF AGRICULTURE, Farm Security Administration, Dallas, Texas: Sealed bids, in triplicate, will be received until 2 o'clock p.m., (cwt) Friday, October 22, 1943, and then publicly opened, offering bonus for operating rights in connection with oil and gas leases on lands in the Texas Farm Tenant Security Project, consisting of 214.453 acres, located approximately 6 miles southeast from the town of Pilot Point, Denton, County, Texas, and being a part of the Isaac Walters Survey. Award of lease will be made to bidder who can show sufficient experience and financial resources and prove citizenship. Interested parties may obtain bid documents, lease forms and operating regulations from the office of the Regional Business Manager, Farm Security Administration, Parry Avenue at Commerce, Dallas, Texas.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, General Land Office, District Land Office, Cheyenne, Wyoming. Notice is hereby given that the lands herein described within the known geologic structure of the East Lance Creek oil and gas field, Wyoming, are offered to qualified bidders of the highest amounts offered per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act as amended by the act of August 21, 1935 (49 Stat. 674, 30 U. S. C. 226) at a sale to be held in the District Land Office at Cheyenne, Wyoming, at 10 a.m. on October 14, 1943, in the following units: Parcel No. 1, T. 36 N., R. 64 W., sec. 28, W½SE¼; Parcel No. 2, T. 36 N., R. 64 W., sec. 29, E½ SE¼. Each lease will be made subject to the unit plan for the East Lance Creek Unit Area, Wyoming, approved March 2, 1938. Each successful bidder must deposit on date of sale with the officer in charge of the sale a certified check or cash for one-fifth of the amount bid by him and file a showing of qualifications to receive a lease as required by section 7 of Circular 1386. The remainder of the bonus bid and annual rental at the rate of $1 per acre must be paid and a $5,000 corporate surety bond must be furnished prior to the issuance of the lease. Each parcel will be offered for sale separately. In the even the same bidder is the successful bidder on both parcels, he may consolidate them into a single lease since the total acreage does not exceed 640 acres. Bids may also be submitted by mail provided they are accompanied by one-fifth of the bonus bid and a showing of qualifications of the bidder. The envelope must be plainly marked for opening on the day and hour of the sale. Bidders are warned against violation of section 59, United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. William G. Johnson, Register.

Statement of the Ownership, Management, Etc., of
THE OIL AND GAS JOURNAL
October 7, 1943

(This statement is published in compliance with the Act of August 24, 1912.)
Published weekly (Thursday) at Tulsa, Okla.
Publisher: The Petroleum Publishing Company, Tulsa, Okla.
Editor: C. O. Willson, Tulsa, Okla.
News Editor: H. Stanley Norman, Tulsa, Okla.
Business Manager: S. H. Rourke, Tulsa, Okla.
Stockholders holding 1 per cent or more of total amount of stock: Helen B. Lauinger, Tulsa, Okla.; P. C. Lauinger, Tulsa, Okla.; Estate of Edward R. Boyle, Oil City, Pa.; Edward P. Boyle, Oil City, Pa.
Known bondholders, mortgagees and other security holders holding 1 per cent or more of the total amount of bonds, mortgages or other securities: None.

S. H. ROURKE
Business Manager.

Sworn to and subscribed before me this 24th day of September, 1943.

JOHN P. GALLAGHER,
Notary Public.
My commission expires March 1, 1947.

NORTH LOUISIANA

Semiwildcat Extends Gas-Distillate Area at Caddo

SHREVEPORT, La.—In Miller County, Arkansas, Arkla Oil Co. 1 Wheless-Kisinger, NW SW 9-20s-27w, extended gas production in the Caddo field some 2 miles east. The well came in the latter part of last week as a gas-distillate producer at 5,948-62 ft. The pay zone and the rate of flow was not determined. The location is about 1¼ miles east of the nearest oil well in the Caddo field. The company was said to be seeking permission to complete the well as a gasser.

WILDCAT COMPLETIONS

Arkansas

Columbia County: Lion Oil Ref. Co. 1 Roberson, NW NW 10-17s-22w, dry, T.D. 8,325 ft.

North Louisiana

Bossier Parish: Sneed & Maynard 1 Thigpen-Herold, NE NE NE 15-20n-13w, dry, T.D. 3,250 ft.

Grant Parish Youngblood & Foree 1 Colfax Lbr., NE NE 8-7n-3w, dry, T.D. 4,977 ft.

MISSISSIPPI

JACKSON, Miss. — The California Co. continued testing at the 1 National Gas Co. of Louisiana, Inc., discovery well of the Cranfield oil field in Adams County, with little information being released on recent tests in the Wilcox zone. Originally tested at deep levels, around 10,270-ft. depth, where it made gas-distillate, the hole was plugged back to run tests in the Wilcox zone, near the 5,880-ft. horizon. It is credited with having made a flow of about 200 bbl. per day but

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, General Land Office, District Land Office, Cheyenne, Wyoming. Notice is hereby given that the land herein described within the known geologic structure of the East Lance Creek oil and gas field, Wyoming, is offered to the qualified bidder of the highest amounts offered per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act as amended by the act of August 21, 1935 (49 Stat. 674, 30 U.S.C. 226), at a sale to be held in the District Land Office at Cheyenne, Wyoming, at 10 a.m. on November 4, 1943, as a single parcel: T. 36 n., R. 64 W., sec. 28, S½NW¼. The lease will be made subject to the unit plan for the East Lance Creek Unit Area, Wyoming, approved March 2, 1938. The successful bidder must deposit on date of sale with the officer in charge of the sale a certified check or cash for one-fifth of the amount bid by him and file a showing of qualifications to receive a lease as required by section 7 of Circular 1386. The remainder of the bonus bid and annual rental at the rate of $1 per acre must be paid and a $5,000 corporate surety bond must be furnished prior to the issuance of the lease. Bids may also be submitted by mail provided they are accompanied by one-fifth of the bonus bid and a showing of qualifications of the bidder. The envelope must be plainly marked for opening on the day and hour of the sale. Bidders are warned against violation of section 59, United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. William G. Johnson, Register.

WILDCATS AND DISCOVERIES

NEW oil and gas pools and extensions reported last week showed a sharp decline from the preceding week. The most remarkable feature, however, was that four of the five oil discoveries were in the McClosky pay in Illinois. These new productive spots are, with one exception, well separated from older production and may represent considerable additions to Illinois' rapidly declining reserves.

The most remote discovery was Superior's McClosky pool opener in northeastern Clay County. Nearest production is at Noble, 6 miles to the southeast and at Sailor Springs, 6½ miles to the southwest. The discovery, however, was a small pumper and will probably not remain on production for long. If there is subsequent drilling, it may prove an edge well on a large accumulation.

In Jefferson County, new pools were opened 1½ miles west of Coil and between Coil and Bluford, respectively. The former discovery, near Elmbranch, was brought in by Gulf as a 500-bbl. well in the McClosky and the other was found by J. H. Williams. It was also a 500-bbl. well in the McClosky.

Still another 500-bbl. McClosky pool opener was National Associated Petroleum Co.'s well south of the Bungay pool in Hamilton County. This may prove to be an extension well, although it is a much better producer than the original discovery, which was brought in in the Aux Vases. The new well, therefore, represents a new pay in this area. The fifth discovery was a small Waltersburg sand well near Uniontown, Union County, Kentucky.

The most important gas discovery was Ohio Oil Co.'s find in Garvin County, Oklahoma. This well is 6 miles from Pauls Valley and is along the same trend as the long axis of that pool. Dry holes between the two areas show that the two structures are separate. The Ohio well found the Simpson considerably higher than at Pauls Valley but all sands were dry, including the underlying Arbuckle. The well was then plugged back and brought in as a gasser in a shallow Pennsylvania pay.

In Ohio, another Clinton sand gas discovery was logged in Hocking County, near the main Clinton gas fields, and in Starr County, Texas, a small gas well opened a new area 1¼ miles southeast of the Lockhart field. This well was shut in.

WILDCAT COMPLETIONS

	Week ended October 2, 1943					Cumulative total for 1943				
	Oil	Distillate	Gas	Dry	Total	Oil	Distillate	Gas	Dry	Total
Ohio	0	0	1	1	2	4	0	20	35	59
Indiana	0	0	0	0	0	2	0	0	48	50
Kentucky	1	0	0	3	4	18	0	2	94	114
Illinois	4	0	0	7	11	53	0	2	317	372
Michigan	0	0	0	6	6	9	0	1	108	118
Kansas	0	0	0	9	9	50	0	0	274	324
Nebraska-Missouri-Iowa	0	0	0	1	1	0	0	0	18	18
Oklahoma	0	0	1	7	8	36	1	14	202	253
Texas:										
North Central	0	0	0	5	5	43	0	1	274	318
West	0	0	0	0	0	9	0	1	63	73
Panhandle	0	0	0	0	0	0	0	0	5	5
East	0	0	0	1	1	4	0	1	83	88
Gulf Coast	0	0	0	1	1	4	7	6	82	99
Southwest	0	0	1	7	8	18	11	3	213	245
Total	0	0	1	14	15	78	18	12	720	828
Louisiana:										
North	0	0	0	2	2	4	0	3	54	61
Gulf Coast	0	0	0	1	1	12	6	1	24	43
Total	0	0	0	3	3	16	6	4	78	104
Arkansas	0	0	0	1	1	2	0	0	51	53
Mississippi and Southeast	0	0	0	1	1	3	0	0	44	47
Montana	0	0	0	2	2	2	0	0	16	18
Wyoming	0	0	0	1	1	6	0	0	14	20
Colorado, Utah	0	0	0	0	0	0	0	1	2	3
New Mexico	0	0	0	1	1	5	0	2	20	27
California	0	0	0	2	2	5	0	8	106	119
Total United States	5	0	3	59	67	289	25	66	2,147	2,527
Total previous week	14	1	2	59	76					

water intrusion has caused squeeze job, no information being released on present tests.

Love Petroleum Co. is putting the 2 Johnson Anderson, discovery well of the Flora area, Madison County, on the pump. Picking up oil shows in the lime from 4,357-67 ft., total depth, it had flowed by heads but lacked sufficient pressure to complete successfully without aid of pumping equipment.

MISSISSIPPI WILDCAT COMPLETIONS

Pontotoc County: S. A. Guiberson, Jr. 1 Edward Hale, 3-10s-3e, dry at 2,234 ft.

FLORIDA

Interest of oil operators in the southeastern United States is centered on Humble Oil & Refining Co.'s deep test in the Suniland area, Collier County, Florida. Shows of oil in porous lime were picked up near bottom of the hole, total depth 11,626 ft., and casing was set to test.

CRUDE-OIL PRICES

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.22
Conroe	1.43
Tepetate, Louisiana	1.18
Illinois basin	1.37
Pecos County, Texas	.95
Bradford, Pennsylvania	3.00
Van, Van Zandt County, Texas*	1.00

*No change since 5-21-41.

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Texas*
18-18.9	$0.80	....	....	....
19-19.9	.84	....	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.83
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.93
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.00
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.00
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

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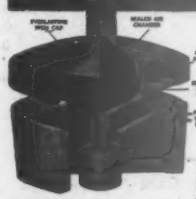

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Among the
Drilling Contractors

C. I. Drilling Corp., Houston, Tex., was moving in this week to start work on an 11,000-ft. contract in the Pine Prairie field, Evangeline Parish, Louisiana, for Gulf Refining Co.

Drilling & Exploration Co., Los Angeles, Calif., are drilling three wells in the Paloma, California, field for the Paloma Unit Operators and has been awarded contract for a fourth well which will be spudded in very soon. Drilling & Exploration Co. has also been awarded a drilling contract covering Union Pacific Railroad 222 fee in the Wilmington field and will move in drilling equipment soon.

Wynn Crosby Drilling Co. of Houston has contract to drill two 10,000-ft. Wilcox tests in the lower Texas Gulf Coast area. Crosby is rigging up at the Francitas Gas (Zachry) 1 Albert Rath, 7 miles southwest of Cuero in DeWitt County, and has derrick up and is preparing to move in on the Northern Ordnance Corp. 1 Heath, about 17 miles northwest of Victoria in Victoria County.

Manning & Brown, Inc., Denver, Colo., has been awarded contract by Union Oil Co. of California, for a test to the granite in the Holbrook district, central eastern Arizona, in Navajo County, in its 1 Aztec Land & Cattle Co., in NE NE NE 19-15n-18e. It will be a joint operation with Continental Oil Co. and will go to approximately 5,000 ft., and test all horizons below the red beds.

R. B. Phillips, Lafayette, La., has the contract for a workover job at Fifteen Oil Co. 3 Parro, in the Charenton field, St. Mary Parish, Louisiana.

Hinkle Drilling Co., Houston, Tex., has spudded 1 John Marek, a wildcat test for Charles E. Fraser, Inc., 12 miles from Somerville, in Burleson County, Texas. Hinkle has the contract also for a workover job on Shell Oil Co., Inc., 2 National Bank, in the Placedo district of Victoria County.

Fain & McGaha, Inc., Wichita Falls, Tex., has contracted to drill John A. Murphy 1 S. J. Clark, C SE NW Section 9, Block 6, H.&G.N. Survey, 12 miles northwest of Childress, Childress County, Texas. Sohio Producing Co., Union Producing Co., Hassie Hunt, Inc., Link Oil Co., and W. A. Delaney, Jr., are among the companies supporting the test which is scheduled to the Ellenburger at approximately 6,500 ft.

Creekmore Drilling Co. has the contract on a test which H. A. Hershfield & Co. has begun in 24-22-12, Stafford County, Kansas. The operators are developing a 2,000-acre block.

L. O. McMillan Drilling Co., Dallas, Tex., will drill a Woodbine sand test for P. N. Wiggins, Jr., C. E. Hyde and Continental Oil Co., on a block of 7,500 acres in Henderson and Anderson counties, Texas. The test will be southeast of Athens but specific location awaits further analysis of recent core drilling.

O. W. Dyer of Houston is drilling Gulf's 11,000-ft. Wilcox wildcat on

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south flank of the Pine Prairie dome, Evangeline Parish, the 1 Chapman-Miller-Lehaye unit in Section 2-4s-1w.

Bell & Loffland, drilling contractors, of Los Angeles, Calif., are completing drilling operations on General Petroleum 4-5-F Noble, which is expected to extend the eastern limits of production in the Helm distillate field in Fresno County, California. When this well is finished the contractor will start work on a second well to be drilled on the Noble lease of General Petroleum in 9-17n-18e.

Ashby Drilling Co. has the drilling contract on Cities Service Oil Co. 2 Harold Fetterle, in C E½ SE SW 9-14n-11w, Newaygo County, Michigan.

Lupher Drilling Co. has the contract on Pure Oil Co. A-1 State-Goodwell, in C E½ SE NW 9-14n-11w, Newaygo County, Michigan.

Loffland Bros. will drill Union Producing Co. 2 Buckley Bourge in the DeLarge area of Terrebonne Parish in South Louisiana, this being a 10,500-ft. contract, the well in Section 1-20s-16e.

Dixie Drilling Co. has been awarded contract on Atlantic 1-B St. Mary Parish Land Co. test at Bayou Sale in St. Mary Parish. This test, located 3,210 ft. E and 597 ft. S of NW corner of Section 2-16s-9e, is contracted to 12,000 ft.

W. A. Richardson Drilling Co., Corpus Christi, Tex., is drilling 1 L. E. Seeligson, in Los Olmos and Loma Blanco grant, Jim Wells County, Texas, for La Gloria Corp.

Housh & Thompson Drilling Co., Houston, Tex., has the contract for drilling Humble Oil & Refining Co. 1 Pontious, in the Katy field, Harris County, Texas. It was near contract depth, 8,500 ft., last week on 1 Hirsch, a wildcat test for William Helis, 7½ miles southeast of Devers, in Liberty County. Housh & Thompson recently completed 1 Morrow, a dry hole, drilled for John B. Hawley, Jr.

Lon H. Cron, Houston, Tex., has the contract to drill 23 Driscoll, in the Conoco-Driscoll field, Duval County, Texas, for Continental Oil Co. This contractor recently completed 1 Porter for Continental in the Porter field, Karnes County.

Brewster-Bartle Drilling Co., Houston, Tex., was setting surface pipe last week for 1 Stranadel, 3 miles northwest of Blessing, in Matagorda County, Texas, for Sun Oil Co. It is planned to carry the hole to 1,000 ft. The rig for the 1 Stranadel is the one used in drilling 1-A Pierce, 1½ miles northeast of Blessing, recently completed for Ohio Oil Co. Brewster-Bartle set surface pipe last week for 1 Roberts Co., 3 miles southwest of Shepherd, in San Jacinto County, for Navarro Oil Co. et al. This is a projected 9,300-ft. test. It was at 4,111 ft. at 1 Dee McElroy, wildcat test in the Hope area of Lavaca County, which it is drilling for Humble Oil & Refining Co. It was at 7,400 ft. at 7 Braman, a Sun well in the North Markham field of Matagorda County.

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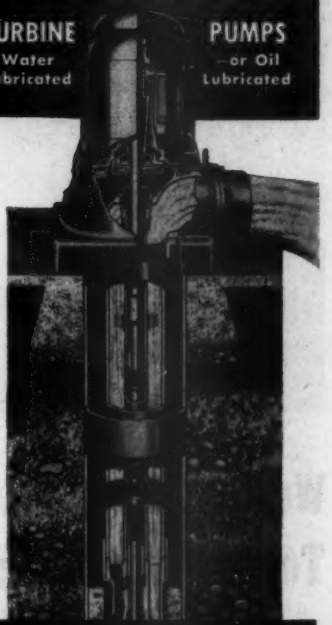

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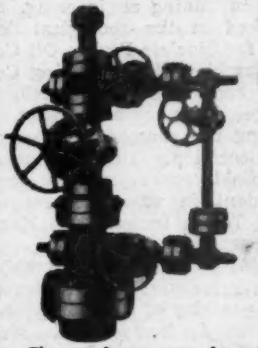

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PERSONALS

H. J. KEMLER

West Texan Is Given Top Production Job In Coastal Area

H J. KEMLER, recently appointed acting production manager for the Texas Gulf Coast area of Shell Oil Co., Inc., was born in Platteville, Wis., attended grade and high school there and then went to the University of Wisconsin to do his work on his degree in mining engineering.

He worked in the geological departments for Sinclair Prairie Oil Co. and the Humble Oil & Refining Co. for a year each before joining Shell at Okmulgee, Okla., as a geologist in 1924. During the succeeding 4 years he was successively field engineer, assistant field superintendent and superintendent in various parts of Oklahoma, Texas, Indiana and Kentucky.

He married in December 1928 while working at Princeton, Ind. He moved to St. Louis in May of 1929 to become office assistant for 2 years to the vice president. This was followed by a 9-month training course at The Hague. After working in Dallas and Houston for short periods, he returned to St. Louis as chief exploitation engineer.

Mr. Kemler became division manager for Shell's Kansas division in 1935 and moved from there to Midland, Tex., in 1938 to become general manager of the West Texas-New Mexico division, a job he gave up to accept his present assignment.

T. P. Cannon, Wichita Falls, head of Beacon Oil & Refining Co., was honored at a banquet by the citizens of Henderson, Tex., in appreciation for bringing in a new oil field northwest of the city from the Pettit lime. The new field is east of the huge East Texas field, and is producing from a new and deeper horizon.

John S. Hunter, representing the marine department of the Atlantic Refining Co., has been nominated treasurer of the Port of Philadelphia Maritime Society.

R. E. Foss, chief engineer of the drilling department in the California division of Barnsdall Oil Co., has been promoted to the general superintendency of all operations on the West Coast with headquarters at Los Angeles. Previously Mr. Foss had held the positions of production foreman and engineer in charge of construction.

J. C. Reinbold, general superintendent of Panhandle Eastern Pipe Line Co., has been elected vice president, continuing his rise in the industry to which he has devoted 36 years of his career. He became general superintendent for Mo-Kan Pipe Line Co. in 1928 and retained that position when Panhandle Eastern was organized.

Glen E. Thompson, who for many years was associated with the Tide Water Associated Oil Co., at Tulsa, has opened offices at 616 Southwest Reserve Life Building, Longview, Tex., where he will be engaged in handling tax matters for the oil industry.

E. B. Reeser, who recently retired as president of the Barnsdall Oil Co., and **Charles Peters** of Tulsa, accompanied by their wives, are visiting in Mexico City.

Charles I. Jennings, geologist for S. E. W. Oil Corp., discussed "Present Problems Confronted by the Geologists" at a meeting of the Corpus Christi, (Tex.) Geological Society in the Plaza Hotel.

Kenneth A. Danskin, chemist in charge of patent suggestions at the Port Arthur, Tex., laboratory of Texas Co., is said to be looking for something to do in his spare time. He is an instructor of classes in fundamentals of petroleum refining which meet 2 nights weekly. He recently helped organize a local chapter of the American Chemical Society and was chosen secretary-treasurer. He is assistant director of the Port Arthur Office of Civilian Defense. He is alderman in the Griffing Park Council and is active in the Griffing Park Volunteer Fire Department, of which he was the first president. He has a Victory garden, and he raises chickens.

D. A. Young, formerly operating superintendent for Sinclair Refining Co. at its plant in Sinco, Tex., has been promoted to superintendent. He succeeds **Parker Kendall,** who has been made assistant refineries manager of the three Sinclair refineries in Texas, at Fort Worth, Corpus Christi and Sinco. Mr. Young has been in Sinclair service 20 years and Mr. Kendall 25. **J. D. Seifer** and **R. B. Thacker,** both Texas A. and M. College graduates, who have been with Sinclair at the Sinco plant for 15 years, will be assistants to Mr. Young.

Tom W. Koch, senior geologist with Standard Oil Co. of Texas, Midland, Tex., was elected president of the Midland Geological Society at the meeting last week. **Charles F. Henderson,** Stanolind Oil & Gas Co., was elected vice-president; **R. E. LeBlond** was elected secretary and treasurer, and **Dr. W. Harris,** Phillips Petroleum Co., was elected chairman of the program committee. **M. G. Cheney,** president of Anzac Oil Corp., Coleman, Tex., was the speaker at the meeting.

E. D. Thompson, for the past 5 years manager of the advertising division of Standard Oil Co. of California, has been appointed assistant general sales manager of the company, and **John E. Scoggins,** formerly assistant cashier, has been appointed cashier. Mr. Thompson has been a member of Standard's official family for the past 28 years and Mr. Scoggins has been with the company since 1911.

Herman W. Taylor, who started as a clerk with Standard Oil Co. of New York back in 1913, and who is at present manager of industrial sales of General Petroleum Corp., recently completed 30 years' service with So-

cony-Vacuum Oil Co. of which General Petroleum is the California subsidiary.

Paul F. Osborne, independent oil operator at Midland, Tex., has been elected president of the Midland chapter of the American Red Cross.

Lt. Allen B. Wilson, who received his commission following a course of technical training at Yale University, is now serving as an engineer in the Army Air Forces in the South Pacific. Lieutenant Wilson, who graduated from Rice Institute in 1940, was employed in the geophysical department of Gulf Oil Corp. in Houston, Tex., when he entered war service.

J. C. Brooks, formerly assistant agent of the producing department for Texas Co., Houston, Tex., has been promoted to department agent.

Gerald Fisher, former superintendent of the chemistry and control laboratory for General Petroleum Corp., at Los Angeles, has ended 3 years in charge of the Washington office for the Socony-Vacuum Oil Co., Inc., and will return to General Petroleum in his former capacity.

G. J. Loetterle, Shell Oil Co., Inc., has been elected president of the East Texas Geological Society. Other officers elected at the recent meeting of the organization are **B. W. Allen,** Gulf Oil Corp., vice president; **Lynn L. Harden,** Sinclair Prairie Oil Co., secretary-treasurer, and **J. H. McGuirt,** member of the executive committee.

Henry P. Evans, who has been scout in the Ardmore, Okla., area for the Skelly Oil Co., has been transferred to Wichita, Kans.

Lawrence C. Hay, of Wichita, Kans., has become geologist in Kansas for Nadel & Gussman, and will have charge of the company's office in that city.

Charles H. Chatham, district gager in Illinois for Oklahoma Pipe Line Co., has retired from active service at the age of 63, after having served the company for nearly 25 years.

James Eber Taylor, of the Seminole, Okla., office of Carter Oil Co., has retired after nearly a quarter century of service with the company.

L. B. Hart, who retired from active service after 24 years with United Natural Gas Co. in the Henderson field, was honored last week at a party held in his home in Oil City, Pa., with 50 company employes, their families and friends attending.

E. V. McCollum and **Craig Ferris,** formerly with Mott-Smith Corp., of Houston, Tex., in the capacity of chief geophysicist and party chief, respectively, have resigned to form E. V. McCollum & Co., with offices in Tulsa.

I. O. Miller, with his wife and daughter, returned to Petroleo, Ont., recently from the Trinidad oil fields where Mr. Miller spent the past 3 years drilling for Trinidad Leaseholds. He will spend a 3-month furlough in Canada.

Earl A. Smith has resigned from the board of directors of Abasand Oils, Ltd., of Edmonton, Alta., to resume his duties at Petrolio, Ont., as superintendent of the Canadian Oil Companies, Ltd., refinery. **George B. Webster** has been named to the Abasand directorate, and has been appointed vice president and general manager of the company, in full charge of its operations in the tar-sand area at Waterways, Alta.

H. D. Jenkins, who has been sales manager for the oil division of the W. T. Waggoner Estate, Vernon, Tex., since 1928, retired October 1. **H. D. Moore,** who has been cashier for the firm, assumed duties as sales manager on that date.

William F. Dalton, chief engineer of a Sun Oil Co. tanker torpedoed in the Atlantic Ocean some months ago, has been awarded the Merchant Marine Distinguished Service Medal for "heroism and meritorious service beyond the line of duty."

Duncan Schwanecke has been assigned to the land department of the Ohio Oil Co. office in Midland, Tex. For the past 7 years he has been scouting the Gulf Coast district for Ohio. He has been with the company for 17 years.

Lisle Stone, who before going to Ceylon was in charge of operations of Texas Co. in Manchukuo, has returned to his home city of Wichita Falls, Tex., for a 1½-month visit with his parents. He is manager for the California Texas Oil Co. storage and distribution properties in Ceylon and has been stationed there since 1937.

Harry R. Johnson, California independent consulting geologist and petroleum engineer, has contributed 178 volumes and numerous geological papers to the University of California at Los Angeles for the Ralph D. Reed library. The latter was chief geologist for Texas Co. in California prior to his death.

Dr. J. B. Reeside, Jr., head of the paleontology and stratigraphy section of the U. S. Geological Survey, Washington, D. C., discussed "Features of Sedimentation on the Upper Cretaceous of the Western Interior" at a recent special meeting of the Houston (Texas) Geological Society. The paper was of particular interest owing to recent oil developments in Mississippi.

J. Elmer Thomas, Fort Worth, Tex., formerly special assistant deputy director of the Petroleum Administration for War and now a consulting engineer and geologist, recently discussed Italian oil fields and showed a movie reel made in the area invaded by Allied troops before a group of Houston, Tex., geologists.

Ralph W. Gallagher, president of the Standard Oil Co. (New Jersey), New York, has been nominated, along with a score of other industrial leaders, for membership in the New York Chamber of Commerce.

Glenn H. McCarthy, Houston, Tex., independent producer, has organized the McCarthy Building Co., which has acquired the 22-story Shell building from the New England Mutual Life Insurance Co., for a consideration of $2,250,000. The building was erected by Ross S. Sterling, former governor of Texas, an oil operator and an officer of Humble Oil & Refining Co.

Ralph Oberholzer, independent operator of Seagraves, Tex., who went into the hog-raising business in a big way some 2 years ago, is in the process of liquidating his swine stocks so he can become active in the oil industry by next spring.

Don Hyatt, geologist, is in charge of an office Sohio Producing Co. is opening this week in Oklahoma City, Okla. **Paul Schofstall** is general office men.

Charley Strange, pioneer oil developer of Michigan, has returned to Clare, in his home state, after spending several months in Texas to regain his health.

C. E. Dobbin, geologist in charge of the Denver, Colo., office of the conservation branch of the U. S. Geological Survey, has been called to Washington for a few weeks of conferences in regard to plans for utilizing the $350,000 appropriation recently made by Congress to promote exploration for new oil reserves.

John D. Northrup, of the Denver, Colo., office of the U. S. Geological Survey, is at Walsenburg, Colo., engaged in geological work on the Rattlesnake Butte structure. **Charles E. Erdman,** of the same office, is in Montana on similar work.

Edward S. Boase, scout for Magnolia Petroleum Co. in Midland, Tex., has been transferred to Great Bend, Kans., and assigned to the land department.

Market Developments

East Coast

NEW YORK.—Action of the OPA in raising the value of A ration coupons and reducing the value of B and C coupons is regarded not only as indication of the continuing improvement in the northeast supply situation but also as an indication of its efforts to eliminate difficulties which have made efficient rationing previously impossible. One of the abuses which made administration of the program ineffective was the use of B and C coupons by car owners with A stamps.

The East Coast index of available supplies rose 0.5 of a point, the second successive gain of this magnitude. This is a decided levelling off from the increases in the preceding 4 weeks and is indicative of the increasing over-all demand due to the early arrival of cool weather and the accompanying demand for fuel oil plus increased gasoline consumption since removal of the pleasure driving ban. Heating oil supplies, augmented by shipments from Mexico, are currently in satisfactory condition.

Action of the South Penn Oil Co. in further reducing sales of Pennsylvania grade crude oil emphasizes the critical condition obtaining in that important source of lubricating oil. Latest figures show a 50 per cent decline in inventories of bright stock, important component of badly needed heavy-duty oils, and in one recent month stocks of neutrals were reduced approximately 20 per cent.

Pacific Coast

LOS ANGELES, Calif.—The possibility of a reduction in gasoline coupon values has tended to weaken gasoline prices. For several months there has been a consistent increase in the number of service stations operating, reflecting the reopening of several hundred outlets that suspended operation subsequent to Pearl Harbor. There is a possibility now that this trend may be arrested if gasoline sales are to be reduced.

Total demand in Pacific Coast territory for August reached approximately 974,000 bbl. daily. This demand is based on a withdrawal of 148,524 bbl. daily from stocks, production of 779,059 bbl. daily in crude oil and 46,000 bbl. per day of natural gasoline. Final data may vary one way or the other but should not materially change the total demand. This demand is being alleviated to some extent by imports from elsewhere but it will take a considerable expansion to offset the rising trend.

The development program up in the Northwest Territory of Canada and the laying of pipe lines to make this production available in Alaska has eliminated the necessity of moving large quantities northward from California to Alaska and the Aleutians.

Mid-Continent

NATURAL gasoline prices, which advanced 0.125 cent per gallon in the middle of last week, held firm with demand continuing to exceed supply. One element in the natural-gasoline market which had made strictly limited sales at figures slightly under the quoted range throughout September withdrew from the selling side.

Calls for natural gasoline are particularly brisk on the Gulf Coast, and from northern buyers. Considerable material continues to move into the eastern shortage area since natural gasoline is exempt from the restrictions applying to tank-car shipments of other petroleum products.

The price of 18-55 natural gasoline, Oklahoma (Group 3), was stationary through September at a range of 4.725 to 4.800 cents per gallon and not 4.125 as shown in the price tables for several weeks. Almost invariably the 18-55 price is 120 per cent of the quotations for 26-70 natural gasoline.

Daily shipments of 129,000 bbl. of gasoline from District 2 refiners to the East Coast during October was a slight modification of the September goal of 150,000 bbl. a day. Prior to September, the eastern movement of gasoline from District 2 had been less than 100,000 bbl. daily. Improved transportation conditions made possible by freeing of tank cars previously in crude-oil service between Norris City, Ill., and the East Coast permitted shipment of greater volumes of gasoline.

At the increased rate of motor-fuel shipments to the East Coast, some of the products were reaching cooperatives which declined to divert the 0.3 cent per gallon, provided in OPA ceiling prices, to the transportation pool. This condition resulted last week in issuance of Petroleum Administrative Order 17, requiring all importers of products into District 1 to obtain approval on shipments through the district director.

Product prices held steady this week. There is a slight softening in the residual-fuel market but buyers are avidly seeking new supplies of gasoline and light burning oils.

Gulf Coast

HOUSTON, Tex.—The easier tone in the residual fuels observable during the past month was more pronounced this week, and mild improvement in motor-fuel stocks was reported. The 1,830,000 bbl. of gasolines of all grades in the tanks of the 12 companies in the Gulf Coast Refiners Association represents about 65 per cent of their normal peacetime storage and is approximately 1,000,000 bbl. less than the same companies reported a year ago.

Appeals for the natural gasoline needed for blending purposes and for making aviation-grade gasoline continues in a market that is sold out. Natural-gasoline manufacturers estimate that 60 per cent of their product now runs into crude-oil pipe lines and thus is taken out of the tank-car market. Integrated companies often have lines which carry crude directly from field to refinery. Where such a line passes fairly close to a natural-gasoline plant a small line is built from the plant to the crude line, enabling the refiner to run natural-gasoline purchases to his refinery with the crude.

Freer offerings of residual fuels are attributed largely to the bigger volume of crude oil available for East Coast refiners as a result of rising importations from South America and of eastward movement of crude through the big-inch line.

A.P.I. REFINERY REPORT

(Figures in thousands of barrels)

Week Ended September 25, 1943

	Dly. crude runs to stills	Stocks: Gasoline	Stocks: Residual	Stocks: Gas oil
Appalachian	159	2,318	459	890
Ind., Ill., Ky.	717	13,594	3,406	5,944
Okla., Kan., Mo.	350	6,203	1,577	2,264
Censored area*	2,060	30,534	18,430	18,723
Rockies	112	1,248	782	445
California	759	16,127	43,011	12,072
Total 9-25-43	4,158	70,024	67,845	40,328
Total 9-18-43	4,209	71,299	66,893	40,299
Total 9-26-42	3,934	78,474	79,341	45,967

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of PAW.

CRUDE OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
September 25, 1943	233,013,000
September 18, 1943 (revised)	233,295,000
September 26, 1942	242,785,000

*Excludes unrefinable California stocks.

Refinery Prices

(Prices as of October 5, 1943)

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

REFINERY GASOLINE

Octane (A.S.T.M.):	†80	74-76	70-72	68-70	63-66
Mid-Continent*	.....	.....	6.000	.....	5.625
Pennsylvania	.....	6.750-7.000	.....	.....	.....
Gulf Coast	6.00-6.50	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750
Northeast Coast	9.80	.....	9.2	9.2	.....
California	6.750-7.500	6.250-6.500	6.125-6.250	5.750-6.125	5.125-5.500

*Basis Group 3. †1939 C.F.R. (research method). §Unleaded.

KEROSENE AND NO. 1 FUEL OIL

Gravity:	46	45	43-44	41-43	38-40
Mid-Continent*	.....	.....	4.500	4.375	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	4.125	.....

*Basis Oklahoma Group 3

TRACTOR, DIESEL, AND BUNKER FUEL OIL

Specifications:	48-48° G	24 D.I.	48-52 D.I.	56 & above	Diesel bunkers	Residual Bunker C†
Mid-Continent*	4.125	.....	.....	.....	.....	$0.80-1.27
California	.....	2.750-4.000	.....	.....	†1.35-1.45	0.85-1.00
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85-1.27
Northeast Coast	.....	.....	.....	6.800	2.780	1.65-2.07
North Louisiana	.....	.....	.....	.....	.....	0.80-1.27

*Basis Oklahoma Group 3. †Gravity range. ‡Pacific Specification 200

FURNACE OIL, GAS OIL, FUEL OIL

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625	3.500	$0.85	$0.80
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
California	5.5	5.5	‡1.10-1.25	§1.10-1.15
Gulf Coast	3.750-3.875	.....	1.35	0.85

*Basis Oklahoma Group 3. †26-40 gravity fuel. ‡Pacific Specification 300. §Pacific Specification 400.

NATURAL GASOLINE

Grades:	26-70	18-55
Oklahoma (Group 3)	4.500	5.400
North Texas	4.125	4.950
North Louisiana	4.250	5.400
California	4.875	5.500

LUBRICATING OILS

Bright and Steam Refined

OKLAHOMA (Group 3)—

300-210 D. 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
400 dark green (untreated)		9.00

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash)

10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
630	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oils

Vis at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:

300-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

CALIFORNIA—

300-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00

Neutral Oils

Red oils:

200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25

GULF COAST—

Pale oils:

200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:

Zero pour point	37.50
10 pour point	36.50
15 pour point	35.50
25 pour point	30.00

200 vis. at 70° F., 3 color:

Zero pour point	39.50
10 pour point	38.50
15 pour point	37.50
25 pour point	32.00

WAX

(Cents per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	4.250

PENNSYLVANIA (Inland refineries)—

122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

NEW YORK—

Wax in bags fully refined

130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150

Crude scale:

124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero tank wag
Baltimore, Md.	15.95	5.50	10.50
Boston, Mass.	14.90	4.50	10.10
Burlington, Vt.	16.90	5.50	10.20
Buffalo, N. Y.	16.20	5.50	10.90
Dover, Del.	16.70	5.50	12.20
Hartford, Conn.	15.60	4.50	10.00
Manchester, N. H.	17.20	5.50	12.10
Newark, N. J.	15.20	4.50	10.00
New York, N. Y.	16.10	5.50	10.10
Philadelphia, Pa.	16.20	5.50	11.90
Pittsburgh, Pa.	16.70	5.50	12.20
Portland, Me.	16.30	5.50	10.20
Providence, R. I.	15.00	4.50	9.90
Washington, D. C.	15.20	4.50	11.20
Average 14 cities	16.02	5.14	10.80

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero tank wag
Chicago, Ill.	14.10	4.50	10.80
Cleveland	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	10.10
Detroit, Mich.	14.40	4.50	10.00
Fargo, N. D.	16.90	5.50	11.60
Huron, S. D.	16.30	5.50	11.00
Indianapolis, Ind.	15.60	5.50	10.10
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.80
Minneapolis, Minn.	15.90	5.50	10.60
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	13.30	4.50	8.70
Average 14 cities	17.46	5.57	9.84

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero tank wag
Atlanta, Ga.	18.90	7.50	*11.50
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.95	7.50	
Charleston, W. Va.	19.25	6.50	13.30
Charlotte, N. C.	20.10	7.50	11.30
Jacksonville, Fla.	18.90	8.50	9.50
Jackson, Miss.	17.50	7.50	†9.00
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	17.90	8.50	10.50
New Orleans, La.	17.75	8.50	10.00
Norfolk, Va.	17.45	6.50	12.20
Average 11 cities	18.24	7.50	10.50

*Includes 1-cent state tax.
†Includes ½-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero tank wag
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero tank wag
Portland, Ore.	17.00	6.50	13.80
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.80
Average 3 cities	16.17	5.83	13.03
Average 50 cities	16.59	5.96	10.93

Equipment Progress

Tractor Grip-Lug Salvages Worn Grouser Shoes

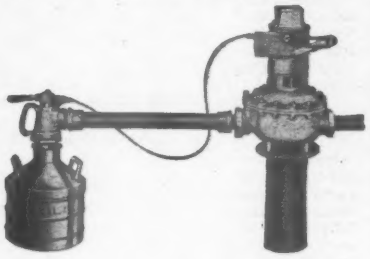
It is now unnecessary to tear down the track assembly of tractors and

replace the worn grouser shoes with new parts, when a simple repair operation will restore the "gripping power" of the track. This is accomplished merely by welding on to the old grouser shoe, a specially designed steel bar, with a groove and bevel to facilitate laying welding bead along the edge which holds the bar and the grouser shoe together as in a vise. The material is a special analysis work-hardening steel which gets harder and tougher with use, and often outlasts the original grouser. The device is manufactured by Allied Steel Products Co., N.B.C. Building, Cleveland, Ohio. Over 80 per cent of the metal of the old shoe is thus salvaged.

New Smaller Model Empire Drum Filler

The increasing demands for small containers of petroleum products, largely brought about by military needs, has prompted National Meter Division of Pittsburgh Equitable Meter Co. to bring out a smaller unit of their Empire drum filler, designated as Model "B." The manufacturer recommends its use in filling containers ranging from 5 to 30 gal. in capacity.

This unit utilizes a 1½-in. Empire oscillating piston meter as the measuring medium. It is fitted with a temperature compensator which automatically corrects to deliver a volume the exact equivalent of the desired



volume at 60° F. It is stated that no manual attention is required since the compensation is done automatically during delivery with every change of temperature as it occurs.

The filler has the same control apparatus as is used on the larger Model "A" unit. This consists of a repeat type register on which is externally mounted a quantity chain having a fixed cam thereon to trip a mechanically operated control valve. Six chains are normally furnished with each drum filler in lengths to meet specified delivery cycles desired.

POWELL CO. PLANTS GIVEN MARITIME AWARD

The Maritime Commission's Award of Merit was recently presented to both plants of Wm. Powell Co., of Cincinnati, Ohio, for outstanding performance in the production of valves not only for the ships of the Victory fleet but also for the many industries engaged in making the machinery, material and equipment for these ships. This company had already received the Army-Navy "E" award.

The presentation of the Maritime Commission's Award was made at an impressive ceremony in the yard of Plant No. 1 Col. Willard F. Rockwell, director of production, United States Maritime Commission, presented the "M" burgee, the Victory fleet flag and the Labor Merit badges. The acceptance speech in behalf of the company was made by George E. Weitkamp, first vice president and secretary. The Labor Merit badges were accepted by James Coombe, president, Wm. Powell Co.; Oliver F. Gang, vice president, representing management; Fred Phillips, Oscar Karhoff, Fred Weber and Edward Bootes, president Local 1858, United Steel Workers of America, C.I.O., who made the speech of acceptance on behalf of the workers.

Improved Dry Chemical Fire Extinguishing Agent

DuGas Engineering Corp., Marinette, Wis., announces the development of an improved dry chemical for use in their dry-chemical fire extinguishers. This new dry chemical, known as "Plus-Fifty DuGas Dry Chemical," is now available from all DuGas distributors without advance in price and does not require a priority because critical materials are not used for its manufacture.

Hundreds of practical fire tests have shown the new dry chemical to be a much more effective extinguishing agent than the dry chemical previously used.

The long effective range of the stream has been retained and the new dry chemical hangs in a cloud over the fire area, providing a greater smothering action and reducing flashbacks.

The improved dry chemical has the same water repellency, noncaking, noncorrosive and nontoxic properties that have been standard with DuGas dry chemical. It has the same nonconductivity to electricity and thus retains its suitability for use on fires in live electrical equipment. And like the former DuGas dry

chemical, the new product is harmless to electrical equipment.

The new DuGas dry chemical is approved by the Underwriters' Laboratories and the Factory Mutual Laboratories.

O-C-T Capitalization Increased

Oil Center Tool Co., manufacturers of drilling control equipment for oil and gas wells, has increased its capitalization from $360,000 to $500,000, it was announced recently.

The increase, second in 5 years, is the result of the company's growing business, it was explained.

Officers of the company are A. J. Penick, president and general manager; H. D. Start, vice president and plant manager, and B. V. Fisher, secretary-treasurer.

Trade Literature

Wagner Electric Co., 6400 Plymouth Avenue, St. Louis, Mo.—A poster adapted from a cartoon by W. G. Conway, depicting a blind soldier, a one-armed sailor and a one-legged marine, entitled Other Victory Taxes (Effective for Life). The company has mailed copies of the poster to its entire mailing list, and has additional copies available for the asking.

Automatic Temperature Control Co., Inc., 34 East Logan Street, Philadelphia, Pa.—Catalog A8, covering ATC Type 303 valve operators. The product described in the literature is a mechanism designed for industrial operation of valves, dampers or other control devices between two adjustable positions for regulation of temperature, pressure, flow or level. The catalog is profusely illustrated with photographs and drawings.

Elliott Co., Jeanette, Pa.—Bulletin M-5, a 16-page brochure presenting the latest refinements in Elliott-Buchi turbochargers for four-cycle diesel engines. Cutaway views in colors are used to illustrate features of turbine, blower, air inlet silencer and the water-cooled, self-contained lubricating system of the turbocharger unit.

Edge Moor Iron Works, Inc., Edge Moor, Del.—Bulletin No. 116, descriptive of the company's process equipment fabrication for chemical industries.

United Steel Services, Ltd., 17 Westbourne Road, Sheffield 10, England. "Fundamentals of Civilisation," a portfolio of eight advertisements of a prestige nature, which represent a big departure from the orthodox publicity usual for technical subject. Clothing, food, agriculture, shelter, power, bridges, communication at a distance, and the written word are the subjects treated.

Goodall Rubber Co., 5 South Thirty-sixth Street, Philadelphia, Pa.—A complete assembly of facts on how to maintain fuel-oil hose, in booklet form.

Joshua Hendy Iron Works, Sunnyvale, Calif.—Westco Industrial Pumps Catalog 43. The catalog gives the complete story about each of the firm's Westco pumps, and a brief description of its line of Pomona pumps. The catalog is featured by duotone illustrations.

Nordberg Manufacturing Co., Milwaukee, Wis.—Bulletin 106, on the firm's line of gas-burning diesels. The folder is printed in four colors, and is profusely illustrated.

Among Equipment Men

Hill and Britton Head Newly Organized Pipe-Line Construction Firm

The Eastern Construction Co., 2609 Mercantile Bank Building, Dallas, Tex., has recently been organized for

CURTIS HILL

J. C. BRITTON

the purpose of providing pipe-line construction service to operators throughout the United States.

The firm is headed by Curtis E. Hill, of Dallas, and J. C. Britton, of Fort Worth, Tex. Mr. Hill, who prior to becoming interested in the petroleum and pipe-line construction industries, served as assistant attorney general in charge of all transportation matters for the Department of Public Safety.

Mr. Britton has had more than 18 years' experience in pipe-line construction work, which includes all phases of this activity. Some of his most important experiences were with O. C. Whitaker Co. where he served as welding superintendent for 4 years and general superintendent for 6 years.

Eastern Construction Co. is now actively engaged in laying section "U" of the 20-in. War Emergency pipe line, extending from a point near Lambersville, to a point near Elizabeth, N. J.

R. S. Products Appoints Two Representatives

Powers Specialty Co., Mellie Esperson Bldg., Houston, Tex., and Douglas Frazier, 1524 South Gary Place, Tulsa, have been appointed distributors for R-S Products Corp. of Philadelphia, Pa., manufacturers of R-S streamline butterfly valves.

Dickson Joins Enardo; Putnam Returns to Company

H. L. Dickson, formerly district manager of Parkersburg Rig & Reel Co., and recently with Petroleum Administration for War at Washington, D. C., and Tulsa, is now with Enardo Foundry & Manufacturing Co., Tulsa, as district manager. Mr. Dickson has been in the oil-well supply business for many years.

J. K. Putnam has returned to Enardo after several months absence.

Scott Joins Industrial Engineering Co. as Research Head

Dr. Gordon N. Scott, expert consultant in corrosion mitigation, has joined the executive staff of Industrial Engineering Co. in the capacity of consulting engineer in charge of research and development. Industrial Engineering Co. is the manufacturer and applier of Somastic pipe coating. Central plants are maintained at Houston, Tex., and Wilmington, Calif., with offices located at Houston; Wilmington; Bartlesville, Okla.; Los Angeles, and San Francisco.

To his new duties Dr. Scott brings an extensive experience in the highly specialized field of corrosion investigation. He has been engaged continuously in research concerned with corrosion prevention since April 1928. In 1928 he was appointed research associate at the National Bureau of Standards, Washington, D. C., in con-

junction with the study of corrosion mitigation and nation-wide tests of protective coatings instituted by the corrosion committee of the American Petroleum Institute. This work occupied him until December 1934, after which he served the corrosion committee of the A.P.I. as pipe-line technologist.

Since January 1936, he has continued his pursuit of solutions to the corrosion problem as an independent consultant, maintaining his headquarters at Los Angeles.

Holder Elected President Of Wickwire Spencer

E. Perry Holder, president of Vulcan Iron Works, Wilkes-Barre, Pa., has been elected president of the Wickwire Spencer Steel Co., Charles Allen, Jr., chairman of the executive committee, has announced. Mr. Holder succeeds E. C. Bowers, who has been connected with the company since 1911 and has been president since 1926. Mr. Bowers has resigned because of serious illness but will continue as a member of the board of directors and executive committee and act in an advisory capacity. Carl I. Collins will continue as executive vice president in charge of production.

Practically all of Mr. Holder's business career has been in executive positions connected with the manufacture and sale of steel and other metal products. He was executive vice president of American Machine & Metals, Inc., New York City, until 1937 and since 1940 has been president of the Vulcan Iron Works of Wilkes-Barre in complete charge of all operations. He is resigning the latter position to become president of Wickwire Spencer.

Miller Appointed Lane-Wells Shop Superintendent

E. A. MILLER

E. A. (Doc) Miller has been appointed general shop superintendent of Lane-Wells Co., according to an announcement by Rodney S. Durkee, president. He will have charge of manufacturing operations in the Los Angeles, Calif., plant which has been enlarged to manufacture war material in addition to their regular oil-well tools and specialized service equipment.

Mr. Miller comes to his new post with a broad background of experience with leading oil companies and manufacturers of oil-well equipment.

Born in Louisiana, "Doc" Miller first went to work for Magnolia Petroleum Co. where he served his apprenticeship as a machinist. He moved to California in 1922 and started with General Petroleum Co. where he became general foreman of their manufacturing and service-maintenance shops.

J. M. O'Melveny Joins Hughes Tool Co. Staff

J. M. O'Melveny, former Gulf Coast manager for Patterson-Ballagh Corp., has joined the sales department of Hughes Tool Co. and will work in the Louisiana district.

Duraloy Names Two

Duraloy Co. of Scottsdale, Penn., producers of static and centrifugal high-alloy castings, announced the appointment of Robert Onan as sales representative in the Chicago area, and Kilsby & Graham as agents in the California area.

Mr. Onan will have his office in the Wrigley Bldg. in Chicago and will be known as the Duraloy Co. of Chicago.

Kilsby & Graham are located in the Standard Oil Bldg., Los Angeles, Calif.

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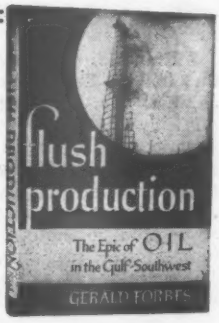

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"It's recommended reading."—Claude V. Barrow, Oil Editor of *The Daily Oklahoman.*

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Send your order and payment to

BOOK DEPARTMENT

The Oil and Gas Journal, Tulsa, Oklahoma

Classified Advertising

EQUIPMENT FOR SALE

CONSTRUCTION Equipment For Sale Eighty-five per cent of new cost. Factory rebuilt.

2—TA-40 wide gage International Tractors equipped with Trackson Pipe-layers.
2—R-5 wide gage, wide track Caterpillars equipped with Cardwell Pipe-Layers
1—Model D Buckeye Back-Filler.
2—TD-18 International Tractors wide gage equipped with Bucyrus Erie Hydraulic Angle Dozer.
1—Caterpillar 40—Gas.
1—Caterpillar 50—Gas.
1—D-6 Tractor.
1—D-8 Caterpillar equipped with Trackson Pipe-Layer.
1—D-7 New Styler Caterpillar equipped with Trackson Pipe-Layer.
1—R-4 Caterpillar equipped with Trackson combination Pipe-Layer and Angle Dozer.
1—Model 32 Buckeye Ditching Machine Wheel type equipped with 21-inch bucket now. Has extra set 14-inch buckets. Will cut up to 33⅛-inch width.
1—Model 12-A Buckeye Ditching Machine Wheel type equipped with 14-inch bucket. Has extra set of 10-inch buckets.
1—R-5 wide gage Caterpillar Tractor equipped with La Plante Choate Hydraulic Angle Dozer.
1—Chicago Pneumatic Air Compressor. 105 feet. 2 Stage.
7—500 gallons Standard Paint Pots.

All this equipment in first-class condition. Available at once. For information rearding the above described equipment, please refer to M. L. Heard or H. V. Bell. 504 First Nat'l. Bank Bldg., Hamilton, Ohio.

FOR SALE at Oklahoma City 100 2" unrepaired Fig. 2605 Flanged Merco Plug Valves. 1500# W.P., Jewel Steel. $12.50 each. Cities Service Oil Company, Patridge, Bartlesville, Oklahoma.

FOR SALE—Complete slim hole rotary outfit, 85' Portable Derrick, three new Allis-Chalmers L-90 engines, 3,000' of 4½" drill pipe, and O.W.S. oil bath rotary table, all in A#1 condition. Located Oklahoma City, Okla. Thos. Whelan, 2612 First Natl. Bldg., Oklahoma City, Okla.

FOR SALE at Oklahoma City one 65 HP Broderick Code LFB Boiler suitable for heating or treating. Price $150.00. Cities Service Oil Company, Patridge, Bartlesville, Oklahoma.

FOR SALE at our El Dorado, Kansas, warehouse: 50,000 feet of 2" used threaded and plain-end pipe, $35.00 per net ton. Cities Service Oil Co., Patridge, Bartlesville, Okla.

Reconditioned, Tested and Guaranteed
Gate Valves for sale, Large stock, sizes 16" to 2", flanged end and screw end. Various pressures.

Stock List and Prices on Request.

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Unlimited quantity of
Pipe — Tubing — Casings
and Valves — All Sizes

FOR SALE
20,000 ft. 2½" Standard black, reconditioned pipe, T. & C.
30,000 ft. 3" O.D. Genuine wrought iron tubes, plain and reconditioned.
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500—6" Rolla grip couplings.

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Kansas City (18), Kansas

EQUIPMENT FOR SALE

WE offer at our Okmulgee, Okla., refinery the following:
9—Riveted Horizontal Steel Tanks, size 5'6" x 25' to 8' x 30'.
20—Small Vertical Riveted, suitable for production tanks.
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4—Badger Towers.
5—10' x 30' Crude Stills.
1—12' x 32' Crude Still.
5—14' x 32' Crude Stills.
1—Green Fuel Economizer.
Patridge, Cities Service Oil Co., Bartlesville, Okla.

LARGE Sullivan Core Drill. Also adaptable to comparatively deep slim hole drilling. Not on truck. Some accessories. Box B-814, The Oil and Gas Journal, Tulsa, Okla.

ELECTRIC POWERED ROTARY DRILLING RIG

Complete, in good operating condition; just off 7,460' Oklahoma well. 2—300-h.p. Sterling gas/butane engines with Marley cooling tower, driving 2 Westinghouse D.C. generators; EMSCO H46 draw works and 25½" roller bearing table, driven by 150/300 h.p. Westinghouse motor through Link Belt speed reducer; 7¼ x 18 Wilson Synder pump, driven by 200-h.p. Westinghouse motor. Exciter, cooling fans and motors, wiring, switchboard. With or without 7,000' 3½" OD drill pipe, excellent condition; 6,500' 4½" OD drill pipe, fair condition. At Seminole, Okla. PIONEER DRILLING COMPANY, 738 Kennedy Bldg., Tulsa, Okla.

FOR SALE: At Barnsdall Okla., approximately 100 Type R Wico Igniters. Take all "as is," $1.00 each. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Near Arkansas City, Kans., 1—25 H.P. Ohio Single Cylinder Gas Engine. $150.00. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: In Kansas 1 #10 Adams Leaning Wheel Grader. Steel wheels and tractor hitch. $650.00. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Refinery equipment. Hi-pressure steel valves and heavy 12" steel pipe, plain ends. List on request. HARVEY BROTHERS, Parkdale, Colo.

ATTENTION Reda Pump Users: 6625' Reda Cable, exceptionally good condition. Leonard Smith Co., 1526 N.E. 19th St. Phone 5-0841, Oklahoma City, Okla.

FOR SALE: 20,000' #2, 3 conductor, 1000 volt, armored Electric Transmission Cable. Repaired and Tested. Immediate Shipment. Leonard Smith Co., 1526 N.E. 19th St. Phone 5-0841, Oklahoma City, Okla.

ONE Keystone Pump Head—1½" Rod. 3¾" Working Barrel. Excellent condition. Write Box 1624, Huntington, W. Va.

FOR SALE

Refinery, 750 Barrels Crude Capacity. Includes Pipe Still, Batch Still, Oil to Oil Heat Exchangers, 24" x 65' Fractionating Tower, Condensers, Pumps, Control Houses, Cooling Towers, Boilers, Piping and Tanks. All completely renovated, and boilers retubed. Located near railroad switch and easy to dismantle. Terms Cash.

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2—60" O.D. x 44' x 4" Thickness Vessels, Hammer-Welded Construction, Fabricated by Krupp. Available for immediate delivery. Price on application.

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REFINERY EQUIPMENT, INC.
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1—Complete Model R Cardwell Unit equipped with D13000 Caterpillar engine.
2—D-17000 Caterpillar Diesel Engines.
2—200 HP. Atlas Imperial Diesel Engines.
2—300 HP. Atlas Imperial Diesel Engines.
1—190 HP. Cooper Bessemer Diesel Engine.
1—5 HP. Atlas Diesel Engine.
2—Diesel Electric Drilling Power Ends.
Various sizes A.C. Motors.
All the above completely rebuilt and modern in every respect. New Bearings of all makes. Big assortment of "V" sheaves, all D Section.

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Complete Bulk Storage Plants from 20,000 Gal. Cap. to 200,000 Gal. Cap.

Please describe Tanks, Pumps, Racks and Trucks

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WE would like to buy, secondhand, subject to inspection, one (1) 300 HP. Clark type RA-3 gas compressor, with or without cylinders. It will probably be in constant use to its rated capacity and if it wasn't in good order, we might still consider it, if it could be repaired. GODFREY L. CABOT, INC., 77 Franklin Street, Boston, Mass.

WANTED
Used Structural Steel
Pipe — Valves
Fittings
Send us your list

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108 N. 2nd St., Kansas City, Kansas

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Journalisms:

THE Journal's mail reflects the fact that the thousands from the oil country now in the military services continue to be interested in what is going on in the oil business and are

looking forward to the time when they can return to the fields, refineries and offices. Whenever they think they are going to have a "breathing spell" they want the Journal to catch up with oil developments.

This week's mail included a subscription request from Capt. Henry F. Schweer, formerly a well-known geologist with headquarters in Oklahoma City and now stationed with the Air Corps in North Africa. He writes in part: "I would like to get back in touch with the oil business. There are quite a few geologists engaged in stratigraphic interpretation work in this section." The picture shows Captain Schweer and two Arabs with German wire entanglements covered with thorn bushes in the background.

CALENDAR

October

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, annual meeting, Blackstone Hotel, Fort Worth, Tex., October 13-14.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Blackstone Hotel, Fort Worth, Tex., October 25.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, petroleum division, fall meeting, Ambassador Hotel, Los Angeles, Calif., October 21-22.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA annual meeting, Fort Worth, Tex., October 25-27.

PETROLEUM DIVISION NATIONAL ASSOCIATION OF CREDIT MEN, annual conference, St. Louis, Mo., October 25-27.

AMERICAN GAS ASSOCIATION twenty-fifth annual meeting, Jefferson Hotel, St. Louis, Mo., October 26, 27 and 28.

MID-CONTINENT OIL AND GAS ASSOCIATION, Louisiana-Arkansas division, Slattery Building, Shreveport, La., October 29.

November

AMERICAN PETROLEUM INSTITUTE, twenty-fourth annual meeting, Palmer House, Chicago, Ill., November 8-11.

December

NINETEENTH EXPOSITION OF CHEMICAL INDUSTRIES, Madison Square Garden, New York, December 6-11.